Supreme Court, U.S.
FILED
MAR 14 1997
OFFICE OF THE CLERK

No. 96-1464

IN THE

Supreme Court of the United States

OCTOBER TERM, 1996

CAT CONTRACTING, INC., MICHIGAN SEWER CONSTRUCTION, KANAL SANIERUNG HANS MULLER GmbH & CO. KG, and INLINER U.S.A.,

Petitioners,

vs.

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V., and INSITUFORM GULF SOUTH, INC.,

Respondents.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

PETITION FOR WRIT OF CERTIORARI

EDWARD W. GOLDSTEIN
Counsel of Record
DOUGLAS H. ELLIOTT
JOHN T. POLASEK
TOBOR & GOLDSTEIN, L.L.P.
1360 Post Oak Blvd., Suite 2300
Houston, Texas 77056
(713) 877-1515

Counsel for Petitioners Cat Contracting, Inc., Michigan Sewer Construction, Kanal Sanierung Hans Muller GmbH & Co. KG, and Inliner U.S.A.

March 13, 1997

76 pp

QUESTIONS PRESENTED

1. Whether the traditional doctrine of amendment estoppel under *Exhibit Supply Co. v. Ace Patents Corp.*, 315 U.S. 126 (1942), has been eviscerated *sub silentio* by the doctrine of so-called "argument estoppel" adopted by the Court of Appeals for the Federal Circuit, under which a patentee, who has narrowed his broad claim by amendment to distinguish prior art, can avoid limiting the range of equivalents by making "equivocal" statements to the Patent Office.

2. Whether argument estoppel is viable, in view of this Court's explicit rejection of argument estoppel in *Keystone Driller Co. v. Northwest Eng. Corp.*, 294 U.S. 42 (1934).

LIST OF PARTIES

The only parties to this proceeding are the petitioners, CAT Contracting, Inc., Michigan Sewer Construction, Kanal Sanierung Hans Muller GmbH & Co. KG, and INLINER, U.S.A, and the respondents, Insituform Technologies, Inc., Insituform (Netherlands) B.V., and Insituform Gulf South, Inc.

RULE 29.6 LIST

Pursuant to Rule 29.6 of the Rules of this Court, petitioners state the following:

The parent companies and subsidiaries (except wholly-owned subsidiaries) of the parties are:

CAT CONTRACTING, INC.

Parent: Inliner Americas, Inc.

MICHIGAN SEWER CONSTRUCTION
KANAL SANIERUNG HANS MUELLER GMBH & CO. KG

Parent: KMG Kanal-Muller-Gruppe

INLINER, U.S.A.

Parent: Inliner Americas, Inc.

TABLE OF CONTENTS

	Page
QUESTIONS PRESENTED	i
LIST OF PARTIES	ii
RULE 29.6 LIST	ii
TABLE OF AUTHORITIES	v
OPINIONS BELOW	1
JURISDICTION	2
STATUTORY PROVISIONS INVOLVED	2
STATEMENT OF THE CASE	2
REASONS FOR GRANTING THE PETITION	7
I. TRADITIONAL AMENDMENT ESTOPPEL HAS BEEN EVISCERATED BY ARGUMENT ESTOPPEL	9
II. THIS COURT SHOULD REAFFIRM ITS REJECTION OF ARGUMENT ESTOPPEL	14
CONCLUSION	20

TABLE OF AUTHORITIES

Cases:	Page
A.G. Spalding & Bros. v. John Wanamaker, 256 F. 530 (2d Cir. 1919)	15
Accord Southwall Tech., Inc. v. Cardinal IG Co., 54 F.3d 1570 (Fed. Cir. 1995)	19
Baltzley v. Spengler Loomis Mfg. Co., 262 F. 423 (2d Cir. 1919)	15
Barrel Fitting & Seal Corp. of Am. v. American Flange & Mfg. Co., 74 F.2d 569 (7th Cir. 1935)	16
Bassick Co. v. Faultless Caster Corp., 105 F.2d 228 (7th Cir. 1939)	16
Black & Decker Mfg. v. Ever-Ready Appliance, 518 F.Supp. 607 (E.D.Mo. 1981), *aff'd* 684 F.2d 549 (8th Cir. 1982)	17
Bowser, Inc. v. Richmond Eng'r Co., 166 F.Supp. 68 (E.D.Va. 1958), *aff'd. in part, rev'd. in part*, 264 F.2d 595 (4th Cir. 1959)	16
Builders Concrete Inc. v. Bremerton Concrete Products Co., 757 F.2d 255 (Fed. Cir. 1985)	18
Catalin Corp. of Am. v. Catalazuli Mfg. Co., 79 F.2d 593 (2d Cir. 1935)	16
Coleco Indus., Inc. v. United States Int'l Trade Comm'n, 573 F.2d 1247 (C.C.P.A. 1978)	17, 18
Computing Scale Co. of America v. Automatic Scale Co., 204 U.S. 609 (1907)	12
Denominational Envelope Co. v. Duplex Envelope Co., 80 F.2d 186 (4th Cir. 1935)	16
Doran Coffee Roasting Co. v. Wyott Mfg. Co., 267 F.2d 200 (10th Cir. 1959)	17

Page

Exhibit Supply Co. v. Ace Patents Corp., 315 U.S. 126 (1942) ..... i, 8, 9, 10, 11, 13, 14, 17

General Elec. Co. v. P.R. Mallory & Co., 298 F. 579 (2d Cir. 1924) 15

Graver Tank & Mfg. Co. v. Linde Air Prod. Co., 339 U.S. 605 (1950) 8, 14

Haynes Int'l v. Jessop Steel Co., 8 F.3d 1573 (Fed. Cir. 1993) 19

Hubbell v. United States, 179 U.S. 77 (1900) 12

Hughes Aircraft Co. v. United States, 717 F.2d 1351 (Fed. Cir. 1983) 17, 18

I.T.S. Rubber Co. v. Essex Rubber Co., 272 U.S. 429 (1926) 12

Jonsson v. The Stanley Works, 903 F.2d 812 (Fed. Cir. 1990) 18

Katz v. Horni Signal Mfg. Corp., 145 F.2d 961 (2d Cir. 1944), *cert. denied*, 324 U.S. 882 (1945) 15

Keyes Fibre Co. v. Chaplin Corp., 97 F.Supp. 605 (D.Me. 1951) 16

Keystone Driller Co. v. Northwest Eng. Corp., 294 U.S. 42 (1934) ..... i, 8, 14, 15, 16, 18, 19

Kinzenbaw v. Deere & Co., 741 F.2d 383 (Fed. Cir. 1984) 19

Mark I Mktg. Corp. v. R.R. Donnelley & Sons, 66 F.3d 285 (Fed. Cir. 1995) 19

Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co., 152 U.S. 425 (1894) 12

	Page
Prodyne Enterprises, Inc. v. Julie Pomerantz, Inc., 743 F.2d 1581 (Fed. Cir. 1984)	19
Quickey Mfg. Co. v. City Prod. Corp., 409 F.2d 876 (6th Cir. 1969)	16
Rambusch Decorating Co. v. A. Ward Henrickson & Co., 41 F.Supp. 512 (E.D.N.Y. 1941)	15
Schriber-Schroth Co. v. Cleveland Trust Co., 311 U.S. 211 (1940)	11
Smith v. Magic City Kennel Club, Inc., 282 U.S. 784 (1931)	12
Standard Oil Co. v. American Cyanamid Co., 774 F.2d 448 (Fed. Cir. 1985)	18
Sutter v. Robinson, 119 U.S. 530 (1886)	12
Texas Instr., Inc. v. United States ITC, 988 F.2d 1165 (Fed. Cir. 1993)	19
Townsend Eng'g Co. v. Hitec Co., Ltd., 829 F.2d 1086 (Fed. Cir. 1987)	18
Warner-Jenkinson Co. v. Hilton Davis Chemical Co., 1997 U.S. Lexis 1476, ___ U.S. ___ (1997)	7, 8, 10, 13, 14
Weber Elec. Co. v. E.H. Freeman Elec. Co., 256 U.S. 668 (1921)	12
Wiegand v. W. Bingham Co., 106 F.2d 546 (6th Cir. 1939), *cert. denied*, 308 U.S. 60 (1940)	16
Statutes:	
28 U.S.C. § 1254(1)	2
28 U.S.C. § 1338(a)	2

	Page
28 U.S.C. § 2201	2
35 U.S.C. § 103	3
Rules:	
SUP. CT. R. 134	2

No.

IN THE

Supreme Court of the United States

OCTOBER TERM, 1996

CAT CONTRACTING, INC., MICHIGAN SEWER CONSTRUCTION, KANAL SANIERUNG HANS MULLER GmbH & CO. KG, and INLINER U.S.A.,

Petitioners,

VS.

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V., and INSITUFORM GULF SOUTH, INC.,

Respondents.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

PETITION FOR WRIT OF CERTIORARI

Petitioners CAT Contracting, Inc., Michigan Sewer Construction, Kanal Sanierung Hans Muller GmbH & Co. KGT, and Inliner U.S.A. respectfully petition for a writ of certiorari to review the judgment of the United States Court of Appeals for the Federal Circuit.

OPINIONS BELOW

The opinion of the court of appeals, styled *Insituform Technologies, Inc. v. CAT Contracting, Inc.*, is published at 99 F.3d 1098 (Fed. Cir. 1996), and was entered on November 5, 1996. A copy of the opinion is reproduced at Appendix A. A copy of the opinion of the district court, which is unpublished, is reproduced as Appendix B.

JURISDICTION

The opinion and judgment of the United States Court of Appeals for the Federal Circuit was entered on November 5, 1996. On December 13, 1996, the petition for rehearing and suggestion for rehearing en banc were denied. A copy of the court's order denying rehearing is reproduced at App. A-46. This petition is filed within ninety (90) days of the denial of the petition for rehearing. SUP. CT. R. 134. This Court has jurisdiction under 28 U.S.C. § 1254(1).

STATUTORY PROVISIONS INVOLVED

No statutory provisions are involved.

STATEMENT OF THE CASE

This is a patent infringement action in which the United States District Court for the Southern District of Texas had jurisdiction pursuant to 28 U.S.C. §§ 1338(a) and 2201.

In this case, the patent owner attempted to secure a patent with broad claims defining his invention. The Patent Office rejected those broad claims as unpatentable in view of the prior art. The patent owner acquiesced to the rejection, canceled the broad claims and submitted a set of narrower claims, which became part of the issued patent. Later, in a patent infringement action, the patent owner alleged infringement under the doctrine of equivalents and asserted a scope of equivalents that included subject matter covered by the broadest of the original claims but not by the broadest of the narrower allowed claims of the issued patent. Instead of following traditional *amendment estoppel* principles of this Court, both the district court and the Federal Circuit followed an "argument estoppel" analysis, using the *statements and remarks* of the patent attorney, to conclude that there was no estoppel that prevented the doctrine of equivalents from covering petitioners' processes. The standard of prosecution history estoppel that has been adopted by the Federal Circuit in this case and others is directly contrary to the precedent of this Court. It demolishes the most important limit on the doctrine of equivalents and provides patentees with a blueprint

for avoiding the surrender of any coverage under the doctrine of equivalents.

The patent in suit is U.S. Patent No. 4,336,012 (the '012 patent), which covers a method for impregnating (or soaking) an absorbent flexible tube or liner with curable resin. The patent discloses and claims an impregnation method that uses a single "vacuum cup" to draw a vacuum from inside the elongated tube. As set forth in Claim 1, the broadest claim and the only one alleged to be infringed, the liquid resin is introduced to one end of the liner. As the resin slowly moves along the inside of the tube, from one end to the other, a small "window" is formed in the tube. and the vacuum cup is placed over the window to draw air from the tube. When the moving resin reaches the window, the cup is removed and the window is sealed. When the cup is removed, the vacuum is interrupted. Then, another window is formed downstream of the moving resin, the cup applied over that window to again draw vacuum, and the same steps are followed, until the entire tube is soaked with resin. App. A-10-11.

The application leading to the '012 patent was filed in February 1981. The original claims were broadly drafted. The broadest claim (which was the only independent claim) was not limited to the manner in which the vacuum was applied. App. A-8-9. The examiner rejected all the claims in light of the only prior art reference cited, an earlier patent granted to Everson, U.S. Patent No. 4,182,262 ("Everson"), stating that "[c]laims 1-6 are rejected under 35 U.S.C. § 103 as unpatentable over Everson et al. The claimed process does not appear to differ in any unobvious respect from that of the reference." App. A-9-10. In response, the patent attorney canceled all the original claims and submitted three new claims that became claims 1-3 of the issued patent. All the claims required the use of a single cup in a discontinuous or interrupted vacuum application process. App. A-14-15.

Petitioners used two impregnation methods. Both were accused of infringing claim 1 of the '012 patent under the doctrine of equivalents. The first method was a multiple-cup

continuous vacuum impregnation process ("Process 1" or the "Multiple Cup Process"). In that process, from four to six cups were used to draw a vacuum from a corresponding number of slits in the tube. When the cup closest to the advancing resin was removed, and the slit beneath it sealed, the remaining cups would continue to draw a vacuum in the tube. The second method ("Process 2" or the "Multiple Needle Process") was a new method designed by the petitioners after the lawsuit began in an effort to move yet further away from the patent claims. In Process 2, the multiple cups of Process 1 were replaced by multiple metal tubes. The metal tubes, known as needles, were inserted through the layers of the tube, rather than merely placed over holes in the wall of the tube, causing them to be anchored in the tube. App. A-11-12.

The district court agreed that there was no literal infringement, but held that both Process 1 and Process 2 infringed the '012 patent under the doctrine of equivalents. App. A-44. The district court held that "the doctrine of prosecution history estoppel *is not available* to Defendants." App. A-44 (emphasis added). Accordingly, the district court did not limit the scope of equivalents so as to prevent a finding of infringement. Petitioners appealed. In November 1996, the Federal Circuit rendered its decision.

The Federal Circuit affirmed the finding of no literal infringement, but found the district court had erred in construing the claims, and concluded the claims were restricted to a single cup discontinuous vacuum process. A-16. The Federal Circuit affirmed the district court's decision on prosecution history estoppel. The Federal Circuit flatly rejected petitioners' contention that "classical prosecution history estoppel" prevented a finding of infringement under the doctrine of equivalents, *even though claim coverage had been surrendered in the Patent Office for the purpose of avoiding prior art*. App. A-17-18.

The Federal Circuit explained that its "objective" standard for determining what subject matter was surrendered "depend[ed] on "what a competitor, reading the prosecution

history, would reasonably conclude was given up by the applicant." However, the court never identified any estoppel based on the amendments, *or even on the words in the claims*. The court used the *statements and remarks* made by the applicant's patent attorney to the Patent Office. The court analyzed the "problems" of the prior art that were supposedly solved by the invention. However, those aspects of the invention *were never included in the claims* themselves, either expressly or implicitly. For example, the Court's discussion centered on the length of the tube being impregnated, the size of the suction compressor, the distance of the vacuum from the resin source, the sizes and locations of the vacuum sources--features that were reflected nowhere in the claims. These became the foundation for the court's "objective" estoppel analysis. The court went so far as to state that "the only express limitation put on the invention by Insituform was the use of a vacuum source close to the resin," even though the closeness of the vacuum source to the resin was *never part of the claim language*. The court's analysis was as follows:

> However, in its statement to the PTO, Insituform specifically noted that the problem with [the prior art] was that "[the prior art] method is ineffective when dealing with long lengths of tube because that method requires an exceedingly large suction compressor." The need for an exceedingly large suction compressor occurred because the [prior art] suction compressor was located at the far end of the tubing. Insituform solved this problem by placing the suction source closer to the resin front, thus allowing the use of a smaller suction compressor. Thus, Insituform unequivocally gave up coverage to a process in which a single vacuum source is located at the far end of the tube.
>
> It is true that, in explaining its amendments, Insituform discussed the use of a single vacuum source which was to be moved along the tube as the resin front advanced. This suggests that Insituform envisioned the use of a discontinuous vacuum created

sequentially by only one vacuum source. *However, this statement alone is too equivocal to be read as a statement which would estop Insituform from equivalently covering a number of small compressors spread along the tube creating a continuous vacuum.* The prosecution history makes clear that the problem to be solved was the need for a large compressor when the vacuum was created a significant distance from the resin source. The use of one vacuum source repeatedly moved down the tube as the resin advances and the use of a number of vacuum sources spread along the tube so that one is always near the advancing resin both solve the problem presented by [the prior art] by placing the vacuum source close to the resin, thereby allowing the use of a smaller vacuum source.

Although a patentee's "unmistakable assertions" to the PTO in support of patentability will estop the patentee from obtaining coverage over surrendered material, here, however, it cannot be said that a reasonable competitor could conclude that Insituform relinquished coverage of processes using either multiple vacuum sources or a continuous vacuum. At no point did Insituform indicate that the [the prior art] problem could be solved only in the manner used by Insituform, *i.e.*, Insituform never stated that the problem could not be solved by using more than one vacuum source or a continuous vacuum. *Rather, the only express limitation put on the invention by Insituform was the use of a vacuum source close to the resin. Thus, in light of the equivocal nature of Insituform's statements, no reasonable competitor could conclude that Insituform gave up coverage of continuous vacuum created by one or more vacuum sources. We therefore conclude that the prosecution history does not estop Insituform from asserting that the right to exclude extends broadly enough to cover either Process 1 or Process 2.*

App. A-17-20. (emphasis added, citations omitted)

The Federal Circuit remanded the case to the district court for new findings and conclusions on the doctrine of equivalents. A-21. At the time of this petition, without considering any additional evidence, the district court had concluded that petitioners infringed under the doctrine of equivalents. Trial on damages, which had been bifurcated, is scheduled for June 1997.

REASONS FOR GRANTING THE PETITION

This case raises two fundamental questions about the doctrine of prosecution history estoppel ("file wrapper estoppel") that were not addressed by this Court in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 1997 U.S. Lexis 1476, ___ U.S. ___ (1997). Both questions relate to the inherent conflict between two types of prosecution history estoppel, namely, traditional "amendment estoppel," based on amendments to the claims, and "argument estoppel,"based on arguments, statements and remarks by a patent attorney during prosecution of a patent in the Patent Office. Resolving these questions would provide a corollary to this Court's decision in *Hilton Davis*, which addressed amendment estoppel but not argument estoppel.

The first question is whether amendment estoppel has been eviscerated *sub silentio* by the Federal Circuit, through invocation of argument estoppel. As sharply illustrated in the present case, petitioners contend that amendment estoppel has been wiped out by argument estoppel. Under argument estoppel, amendments *do not create estoppel or limit the range of equivalents*. Nor do "equivocal" statements. Only "unequivocal" statements by the patentee regarding what has been surrendered or relinquished create estoppel. Petitioners contend that this places far too much power into the hands of patentees, giving them a virtual "blueprint" for avoiding prosecution history estoppel entirely. By amending the claims, but minimizing or avoiding statements and remarks to the Patent Office, a patentee can avoid significant limits on the scope of equivalents. Petitioners submit that this

"blueprint" annihilates amendment estoppel and dangerously erodes the limits that have been placed on the doctrine of equivalents for over 100 years.

The second question is whether argument estoppel is even viable, in view of this Court's explicit rejection of argument estoppel in *Keystone Driller Co. v. Northwest Eng. Corp.*, 294 U.S. 42 (1934), where the Court squarely held that a patentee's statements do not have "the force of an estoppel." Petitioners contend that, in spite of that holding, argument estoppel has nevertheless become an integral part of Federal Circuit jurisprudence. In *Hilton Davis*, the Court cited *Keystone Driller* with approval, but did not address whether *Keystone Driller* still stood for this Court's rejection of argument estoppel. Petitioners submit that a resolution of that issue is critical, particularly in view of *Hilton Davis*.

In a nutshell, petitioners are requesting that this Court clarify the contours of prosecution history estoppel. On the one hand, petitioners are asking that this Court restate and revitalize its traditional amendment estoppel standard, set forth in *Exhibit Supply* over fifty years ago but eclipsed by argument estoppel. On the other hand, petitioners are asking this Court to reemphasize its rejection of argument estoppel, as set forth in *Keystone Driller*. Following the traditional amendment estoppel standard would provide much-needed clarity and predictability in patent law. Consistent with *Hilton Davis*, estoppel would arise only by virtue of an amendment, although not all amendments would create estoppel. An amendment added in the Patent Office by a patentee to distinguish an invention from prior art would create an estoppel only to the extent it *prevents the patentee from ignoring that limitation under the doctrine of equivalents in later litigation.* However, as to limitations in the original claims, the scope of equivalents would be untouched. The standard would not be inconsistent with either *Hilton Davis* or *Graver Tank & Mfg. Co. v. Linde Air Prod. Co.*, 339 U.S. 605 (1950), in that patentees would not be at the mercy of unsparing verbalism. However, the standard would preserve the notice function of patent claims, and competitors would be able to more reliably

determine a patent's outer boundaries. Furthermore, placing greater weight on amendments would reinforce the policy that patent claims should be carefully drafted and amended in the quest of defining the outer boundaries of a patent.

I. TRADITIONAL AMENDMENT ESTOPPEL HAS BEEN EVISCERATED BY ARGUMENT ESTOPPEL

A. The Federal Circuit's Argument Estoppel Standard Ignores Claim Amendments and Provides Patentees With a Blueprint for Avoiding Limits on the Doctrine of Equivalents

This Court's well-established rule on prosecution history estoppel, set forth in *Exhibit Supply*, has been eviscerated *sub silentio* by the Federal Circuit. This is well illustrated in the present case, where the Federal Circuit did not measure the estoppel in terms of the amendments, *or even the words in the claims*. Rather, the court used only the *statements and remarks* made by the applicant's patent attorney to the Patent Office. The court analyzed the "problems" of the prior art that were supposedly solved by aspects of the "invention." However, those aspects of the "invention" *were never included in the claims* themselves, either expressly or implicitly. For example, the estoppel analysis focused on the length of the tube being impregnated, the size of the suction compressor, the distance of the vacuum from the resin source, and the sizes and locations of the vacuum sources. Even though those "features" were reflected nowhere in the claims, they became the very foundation for the court's "objective" estoppel analysis. The court went so far as to state that "the *only express limitation* put on the invention by Insituform was the use of a vacuum source close to the resin," even though that was *never part of the claim language*. A-20.

The *Insituform* case thus reveals two striking features of argument estoppel. First, argument estoppel removes *all consequences from the amending of claims*. The claim language is irrelevant, and amendments have *no disclaimer* effect. The words in the claims, carefully selected by the patentee and

agreed upon by the Patent Examiner as the "metes and bounds" of the protected invention, have lost all legal effect insofar as the doctrine of equivalents is concerned.

Second, only "unequivocal" remarks and arguments of the patentee can create estoppel. Any statements that are not "unequivocal" have no estoppel effect, and any doubts as to what the patentee "gave up" are resolved in favor of the patentee. Herein lies the "blueprint" for avoiding estoppel. Even a patentee who has amended his claims during prosecution, narrowing them to avoid prior art and satisfy the patent examiner, can still retain the same broad scope of equivalents *as though he made no amendment at all*. He or she merely needs to follow the "blueprint" and be clever enough to minimize or avoid remarks to the Patent and Trademark Office. Provided no statements that qualify as "unequivocal" surrender of coverage are made, no estoppel exists to limit equivalents. The result is an unpredictable limit, if any, on the doctrine of equivalents. Consequently, a competitor in the marketplace, who does not literally infringe a patent, but who has been accused of infringement under the doctrine of equivalents, will never know until the final appeal whether he has infringed the patent. Avoiding infringement has become a game of chance.

B. This Court Has Recognized Only Amendment Estoppel

The only form of estoppel ever endorsed by this Court is amendment estoppel. In *Hilton Davis*, this Court affirmed the viability of prosecution history estoppel. *Hilton Davis*, 1997 U.S. Lexis at *40. However, in *Hilton Davis*, argument estoppel was not an issue. There, both parties had agreed that some estoppel was created by the *amendments* to the claims. The only question was whether a particular amendment created an estoppel so as to preclude infringement under the doctrine of equivalents.

Before *Hilton Davis*, this Court had last addressed the doctrine of prosecution history estoppel over 50 years ago, in *Exhibit Supply*. In that case, the Court likewise defined the estoppel in terms of the *amendments*, not the *arguments*. The

patent covered an early version of the pinball machine, having electrical contact switches. In the original patent application, the claims provided for a "conductor means carried by the table." *Exhibit Supply*, 315 U.S. at 136. After the Patent Office examiner rejected these claims as being overly broad in view of prior art, the patentee amended his claims, by replacing the phrase "carried by the table" with the phrase "embedded in the table." *Id.* After this amendment, the patent issued. Later, when suing for infringement, the patentee relied on the doctrine of equivalents. Although the original broad claims would have been literally infringed, the narrower amended claims were not. The defendant's devices contained a nail or pin, which was "carried by the table," but was not "embedded in the table." The Court held that infringement by equivalents was barred by amendment estoppel. The Court reasoned: "*By striking that phrase* [carried by the table] from the claim *and substituting* for it 'embedded in the table' the applicant restricted his claim to those combinations in which the conductor means, though carried on the table, is also embedded in it." *Id.* (Emphasis added.) This Court also held: "*By the amendment*, [the patentee] recognized and emphasized the difference between the two phrases and *proclaimed his abandonment of all that is embraced in that difference*." *Id.* The Court stated the principle that "recourse may not be had to [the doctrine of equivalents] to recapture claims which the patentee has surrendered by amendment." *Id.* The Court explained that "what the patentee, by strict construction of the claim, has disclaimed...cannot now be regained by recourse to the doctrine of equivalents, which at most operates, by liberal construction, to secure to the inventor the full benefits, not disclaimed, of the claims allowed." *Id.* In *Exhibit Supply*, it was the *amendment* that created the estoppel, *not* the prior art or the arguments or remarks made to the Patent Office.

Before *Exhibit Supply*, this Court had consistently recognized the limiting effects of *amendments* on the doctrine of equivalents. *E.g.*, *Schriber-Schroth Co. v. Cleveland Trust Co.*, 311 U.S. 211, 221 (1940) ("the patentee may not, by resort to the doctrine of equivalents, give to an allowed claim a scope which it might have had without the amendments, the

cancellation of which amounts to a disclaimer"); *Smith v. Magic City Kennel Club, Inc.*, 282 U.S. 784, 789 (1931) ("where a patentee has narrowed his claim, in order to escape rejection, he may not 'by resort to the doctrine of equivalents' give to the claim the larger scope which it might have had without the amendments which amount to disclaimer"); *I.T.S. Rubber Co. v. Essex Rubber Co.*, 272 U.S. 429, 440, 444 (1926) ("where an applicant whose claim is rejected on reference to a prior patent, without objection or appeal, voluntarily restricts himself by an amendment of his claim to a specific structure, having thus narrowed his claim in order to obtain a patent, he 'may not by construction, or by resort to the doctrine of equivalents, give to the claim the larger scope which it might have had without the amendments which amount to a disclaimer'"); *Weber Elec. Co. v. E.H. Freeman Elec. Co.*, 256 U.S. 668, 677-78 (1921) ("having thus narrowed his claim...in order to obtain a patent, the patentee may not by construction, or by resort to the doctrine of equivalents, give to the claim the larger scope which it might have had without the amendments, which amounts to a disclaimer"); *Computing Scale Co. of America v. Automatic Scale Co.*, 204 U.S. 609, 618-20 (1907) (original claims rejected based on lack of invention over prior patents); *Hubbell v. United States*, 179 U.S. 77, 83 (1900) (patentee estopped from excluding a claim element where element was added to overcome objections based on lack of novelty over prior patents); *Morgan Envelope Co. v. Albany Perforated Wrapping Paper Co.*, 152 U.S. 425, 429 (1894) ("[the] patentee, having once presented his claim in that form, and the Patent Office having rejected it, and he having acquiesced in such rejection [by amending his claim], he is...now estopped to claim the benefit of his rejected claim or such a construction of his amended claim as would be equivalent thereto."); *Sutter v. Robinson*, 119 U.S. 530, 541 (1886) (estoppel applied where, during patent prosecution, the applicant "was expressly required to state that [the device's] structural plan was old and not of his invention").

C. Amendment Estoppel Is Predictable and Fair

Petitioners are merely asking this Court to confirm its traditional amendment estoppel standard, set forth over fifty years ago in *Exhibit Supply*. Petitioners contend that amendment estoppel is both predictable and fair. Predictable because, where a claim is amended in the Patent Office, by adding a limitation, thus narrowing the claim and avoiding conflict with the prior art, *that amendment has predictable consequences*. Quite simply, it cannot be ignored by the patentee when infringement is being asserted under the doctrine of equivalents. If that added limitation is not present in the product or process being accused of infringement, then there can be no infringement under the doctrine of equivalents. This gives competitors a rational basis for designing around a patent claim. On the other hand, if the added limitation is present in the accused product or process, then the patentee is free to argue infringement expansively under the doctrine of equivalents. Thus, it is *the amendment* that identifies precisely what *can and cannot* be expanded under the doctrine of equivalents. Amendment estoppel is also fair, because the limit on the doctrine of equivalents, i.e., the added limitation, is added *voluntarily* as part of the negotiation between the patentee and the Patent Office. Moreover, because the added limitation emphasizes what is "new" in the invention, it is therefore critical and should not be discarded when determining whether an accused infringer has "pirated" the invention. If the alleged "pirate" has not at least taken what is "new," then how in all fairness can he be said to infringe?

The *Exhibit Supply* standard still works, and would supply much-needed clarity and predictability to the limits on the doctrine of equivalents. That standard urged by petitioners is that any limitation added to a claim by a patentee in the Patent Office to distinguish an invention from prior art creates an estoppel to the extent it *prevents the patentee from ignoring that limitation under the doctrine of equivalents in later litigation*. As to limitations in the original claims, i.e., those that were not added by amendment, the scope of equivalents would be untouched. Such a standard, reflected in both *Hilton*

Davis and *Exhibit Supply*, would also be consistent with the policies in *Graver Tank*. Patentees would not be at the mercy of unsparing verbalism, but at the same time, patent claims would provide their notice function, and competitors would be able to more reliably determine a patent's outer boundaries. Events in the Patent Office would have consequences that would be foreseeable and fair. Placing a greater weight on amendments would reinforce the policy that patent claims should be carefully drafted and amended in the quest of defining what is both patentable and protectable.

II. THIS COURT SHOULD REAFFIRM ITS REJECTION OF ARGUMENT ESTOPPEL

A. This Court Has Unequivocally Rejected Argument Estoppel

Argument estoppel has never been part of this Court's jurisprudence. In *Hilton Davis*, this Court cited *Keystone Driller* as support for the viability of amendment estoppel. *See Hilton Davis* at *24 (prosecution history estoppel has historically been "tied to amendments ..."). However, what the Court did not say in *Hilton-Davis* was that *Keystone Driller* also stands for this Court's unequivocal *rejection* of argument estoppel, where the Court said:

> *We do not attribute the force of an estoppel to what was said by the claimant* in seeking to avoid the prior art cited against his broad claims, but we do apply the principle that where such broad claims are denied and a narrower substituted, the patentee is estopped to read the granted claim as the equivalent of those which were rejected.

Keystone Driller 294 U.S. at 48 (emphasis added). The Court proceeded to apply traditional amendment estoppel to find no infringement under the doctrine of equivalents.

B. Even After *Keystone Driller*, the Circuit Courts Have Been Split Over Argument Estoppel

In spite of *Keystone Driller*, the circuit courts have remained split on the issue of argument estoppel, i.e., whether arguments and remarks made to the Patent Office during prosecution of the patent application could limit the doctrine of equivalents. Argument estoppel had been rejected by the Second, Fourth and Seventh Circuits, but it had been adopted by the Sixth and Eighth Circuits and by the predecessor to the Court of Appeals for the Federal Circuit, i.e., the Court of Customs and Patent Appeals. (However, it is perhaps significant that the debate was always over whether argument estoppel could be used as an *additional* grounds for limiting the scope of equivalents, not whether argument estoppel would *supersede* and *replace* amendment estoppel.)

Before *Keystone Driller*, beginning as early as 1919, the Second Circuit had rejected argument estoppel. *Baltzley v. Spengler Loomis Mfg. Co.*, 262 F. 423, 426 (2d Cir. 1919)("the only purpose for which the file wrapper can be examined is to ascertain whether estoppel has arisen through rejected claims"); *A.G. Spalding & Bros. v. John Wanamaker*, 256 F. 530, 533 (2d Cir. 1919)("we do not look at the arguments of the applicant to the examiner..."); *see General Elec. Co. v. P.R. Mallory & Co.*, 298 F. 579, 586 (2d Cir. 1924)("The offer of various parts of the file wrapper of the patent at bar, consisting of attorney's arguments, statements, or deductions, was flatly opposed to the rule so often stated in this circuit").

After *Keystone Driller*, the Second Circuit continued to reject argument estoppel. *See, e.g., Katz v. Horni Signal Mfg. Corp.*, 145 F.2d 961, 963 (2d Cir. 1944), *cert. denied*, 324 U.S. 882 (1945); *Rambusch Decorating Co. v. A. Ward Henrickson & Co.*, 41 F.Supp. 512, 515 (E.D.N.Y. 1941)("in this Circuit neither party may depend on arguments between the Patent Office and Patent Solicitor"). According to none other than Judge Learned Hand, "We have often stated that we would not look at arguments used by solicitors to the

examiners." *Catalin Corp. of Am. v. Catalazuli Mfg. Co.*, 79 F.2d 593, 594 (2d Cir. 1935).

Several other circuits followed *Keystone Driller* and the Second Circuit, including, for example, the First, Fourth and Seventh Circuits. *See, e.g., Bassick Co. v. Faultless Caster Corp.*, 105 F.2d 228, 231 (7th Cir. 1939)("the terms of a claim should not be limited or extended by mere extraneous remarks of the applicant in argument without an actual amendment of the claim to that effect"); *Barrel Fitting & Seal Corp. of Am. v. American Flange & Mfg. Co.*, 74 F.2d 569, 571 (7th Cir. 1935)("distinctions are made and limitations are sometimes placed on language of claims by applicant's counsel which are somewhat inaccurate or made to meet a precise prior art citation, and without much thought as to their effect on other structures designed to avoid infringement"); *Denominational Envelope Co. v. Duplex Envelope Co.*, 80 F.2d 186, 192-93 (4th Cir. 1935)("the statement of the solicitor in the course of the Patent Office proceeding...may not be carried into the claims allowed"); *Bowser, Inc. v. Richmond Eng'r Co.*, 166 F.Supp. 68, 76 (E.D.Va. 1958), *aff'd. in part, rev'd. in part*, 264 F.2d 595 (4th Cir. 1959)("Mere arguments of a patent solicitor before the Patent Office do not constitute file wrapper estoppel especially where such arguments are based upon limitations not carried into the claims"); *Keyes Fibre Co. v. Chaplin Corp.*, 97 F.Supp. 605, 613 (D.Me. 1951)("The law is clear that this Circuit cannot look to the arguments of counsel to the Patent Office to establish estoppel of the patentee as to the scope of allowed claims").

However, the Sixth, Eighth and Tenth Circuits followed a contrary view, even after *Keystone Driller*. They ruled that arguments made to the Patent Office could constitute a separate basis for estoppel, even without a corresponding amendment. *E.g., Quickey Mfg. Co. v. City Prod. Corp.*, 409 F.2d 876 (6th Cir. 1969); *Wiegand v. W. Bingham Co.*, 106 F.2d 546, 548 (6th Cir. 1939), *cert. denied*, 308 U.S. 60 (1940)("where in the difficult art of claim draftsmanship terms employed in effort to avoid prior art are susceptible of construction transcending the clear limits of the inventive

concept, there should be no more reluctance to search for precise meaning than in a private contract"); *Black & Decker Mfg. v. Ever-Ready Appliance*, 518 F.Supp. 607, 615 (E.D.Mo. 1981), *aff'd* 684 F.2d 549 (8th Cir. 1982)("File wrapper estoppel applies equally to arguments before the patent office as to actual amendments of claims."); *Doran Coffee Roasting Co. v. Wyott Mfg. Co.*, 267 F.2d 200 (10th Cir. 1959).

This Court has never addressed the conflict among the circuits over the issue of argument estoppel.

C. Adoption and Expansion of Argument Estoppel by the Federal Circuit

Argument estoppel was also adopted and then expanded by the Federal Circuit. The first time the Federal Circuit addressed argument estoppel was shortly after the court's creation in 1982, in *Hughes Aircraft Co. v. United States*, 717 F.2d 1351 (Fed. Cir. 1983). There, the court stated the rule that estoppel applies to "all arguments submitted to obtain the patent." *Id.* at 1362. It cited a decision from its predecessor court, the Court of Customs and Patent Appeals. *Coleco Indus., Inc. v. United States Int'l Trade Comm'n*, 573 F.2d 1247 (C.C.P.A. 1978). In *Coleco*, the CCPA held that the patentee was estopped from covering the accused products (swimming pools) using the doctrine of equivalents. *Id.* at 1258. The CCPA said:

> We are in the position of enunciating a rule broader than the traditional "file wrapper" doctrine. A patentee having *argued* a narrow construction for his claims before the United States Patent and Trademark Office (PTO) should be precluded from arguing a broader construction for the purposes of infringement.

Id. at 1257 (emphasis in original). In *Coleco*, the court admitted that *Exhibit Supply* applied estoppel "to amendments only." *Id.* The court also proclaimed that what it referred to as "estoppel by admission" was a new concept that represented

an *extension* of the traditional estoppel doctrine espoused by this Court. In justifying that extension, the court said:

> There is no practical reason to restrict this estoppel theory to the doctrine of file wrapper estoppel as applied by the traditional view. ... *We find no reason not to extend the traditional estoppel doctrine beyond estoppel by amendment* to estoppel by admission.

Id. at 1258.

The Federal Circuit later sidestepped a direct conflict with *Keystone Driller* in *Builders Concrete Inc. v. Bremerton Concrete Products Co.*, 757 F.2d 255 (Fed. Cir. 1985). There the patentee had cited *Keystone Driller* for the proposition that "file wrapper estoppel cannot arise without an amendment." *Id.* at 258. But the Federal Circuit applied principles of traditional amendment estoppel, holding that prosecution history estoppel limited equivalents in one claim as a result of a limitation added to another claim. "To hold otherwise would be to exalt form over substance and distort the logic of this jurisprudence, which serves as an effective and useful guide to the understanding of patent claims." *Id.* at 260.

However, subsequent decisions by the Federal Circuit followed the rule set forth in *Hughes* without ever discussing the inherent conflict between *Hughes* and *Keystone Driller*. *E.g.*, *Jonsson v. The Stanley Works*, 903 F.2d 812 (Fed. Cir. 1990); *Townsend Eng'g Co. v. Hitec Co., Ltd.*, 829 F.2d 1086, 1090 (Fed. Cir. 1987)("Prosecution history estoppel applies both 'to claim amendments to overcome rejections based on prior art, and to arguments submitted to obtain the patent'"); *see Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 452-53 (Fed. Cir. 1985) (no infringement where patentee expressly represented that certain ingredient was outside scope of claims).

Recently, the Federal Circuit has vigorously expanded the scope of argument estoppel. Now, even arguments that were not made to overcome a prior art rejection can create estoppel.

In *Texas Instr., Inc. v. United States ITC*, 988 F.2d 1165, 1174 (Fed. Cir. 1993), the court held that "[u]nmistakable assertions made by the applicant ... in support of patentability, whether or not required to secure the allowance of a claim, also may operate to preclude the patentee from asserting equivalency ...." *Accord Southwall Tech., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1580-81 (Fed. Cir. 1995) ("clear assertions made during prosecution in support of patentability, whether or not actually required to secure allowance of the claims" could also create estoppel). In *Haynes*, the Federal Circuit listed various actions taken during prosecution that could create estoppel, including arguments submitted to obtain the patent, statements contained in disclosure documents submitted to the PTO, representations made during prosecution of the patent, remarks made regarding prosecution of a claim not in suit, and statements made after an examiner indicated claims were allowable. *Haynes Int'l v. Jessop Steel Co.*, 8 F.3d 1573, 1578-79 (Fed. Cir. 1993).

The Federal Circuit has described its standard for determining the scope of estoppel, i.e., the limits on the doctrine of equivalents, as "objective and depends on what a competitor, reading the prosecution history, would reasonably conclude was given up by the applicant." *E.g.*, *Mark I Mktg. Corp. v. R.R. Donnelley & Sons*, 66 F.3d 285, 291 (Fed. Cir. 1995). That language originated in *Kinzenbaw v. Deere & Co.*, 741 F.2d 383 (Fed. Cir. 1984) and later in *Prodyne Enterprises, Inc. v. Julie Pomerantz, Inc.*, 743 F.2d 1581, 1583 (Fed. Cir. 1984). It became established as the applicable rule for determining the scope of estoppel in *Haynes*, 8 F.3d at 1578-79. Since *Haynes*, the standard above has been followed consistently by the Federal Circuit.

Petitioners submit that argument estoppel is problematic, unfair and unpredictable. Petitioners therefore submit that this Court's prior rejection of argument estoppel in *Keystone Driller* should be confirmed. Perhaps argument estoppel has a legitimate role in certain circumstances. But, at most, it should be used to *extend* amendment estoppel, i.e., to provide *additional* limits on the scope of the doctrine of equivalents. It

should never be used to *abrogate* amendment estoppel, and provide the patentee with yet another way to avoid consequences of decisions deliberately made in the Patent Office to secure claims. At the very least, this Court should clarify whether argument estoppel is viable at all, to avoid confusion and continued adherence and further expansion of argument estoppel by the Federal Circuit.

CONCLUSION

To resolve whether this Court's case law regarding prosecution history estoppel is a viable limit on the doctrine of equivalents, this petition for Writ of Certiorari should be granted.

Respectfully submitted,

EDWARD W. GOLDSTEIN
Counsel of Record
DOUGLAS H. ELLIOTT
JOHN T. POLASEK
TOBOR & GOLDSTEIN, L.L.P.
1360 Post Oak Blvd., Suite 2300
Houston, Texas 77056
(713) 877-1515

Counsel for Petitioners Cat Contracting, Inc., Michigan Sewer Construction, Kanal Sanierung Hans Muller GmbH & Co. K.G., and Inliner, U.S.A.

March 13, 1997

APPENDIX

Appendix A

INSITUFORM TECHNOLOGIES, INC., Insituform (Netherlands) B.V. and Insituform Gulf South, Inc., Plaintiffs/Cross-Appellants,

v.

CAT CONTRACTING, INC., Michigan Sewer Construction, Kanal Sanierung Hans Mueller GmbH & Co KG and Inliner U.S.A., Defendants-Appellants.

Nos. 96-1078, 96-1099.

United States Court of Appeals, Federal Circuit.

Nov. 5, 1996.

Harold James, James & Franklin, New York City, argued, for plaintiffs/cross-appellants.

Edward W. Goldstein, Tobor & Goldstein, L.L.P., Houston, TX, argued, for defendants-appellants. With him on the brief was John T. Polasek.

Before ARCHER, Chief Judge, MICHEL, and SCHALL, Circuit Judges.

MICHEL, Circuit Judge.

Inliner[1] appeals from the district court's order denying its motion for post-verdict judgment notwithstanding the verdict ("JNOV")[2] of invalidity of United States Patent No.

---

[1] "Inliner" is a collective reference to four separate defendants: Cat Contracting, Inc.; Michigan Sewer Construction Co.; Kanal Sanierung Hans Mueller GmbH & Co. KG; and Inliner U.S.A.

[2] A JNOV is now known as a judgment as a matter of law ("JMOL"). As JNOV was the proper terminology used at the time Inliner filed its motion, we will use it throughout this opinion.

4,336,012 ("the '012 patent"), the district court's order denying its motion to amend certain counterclaims, and the district court's final decision finding infringement under the doctrine of equivalents. Insituform[3] cross-appeals from the district court's order granting Inliner's motion for post-verdict JNOV of no literal infringement of claim 1 of the '012 patent. The case was submitted for decision after oral argument on July 10, 1996. We affirm in all respects, except one: we vacate the finding of infringement under the doctrine of equivalents and remand to redetermine infringement under the doctrine because, although the prosecution history of the '012 patent does not estop Insituform from claiming that the accused processes infringe, the district court's doctrine of equivalents infringement analysis was tainted by the use of an incorrect claim construction.

The appeal and cross-appeal at bar arise from a complex series of trials spanning five years in the U.S. District Court for the Southern District of Texas, Case No. H-90-1690. In February 1990, Insituform brought suit against Inliner, alleging infringement of the '012 patent. Inliner filed an answer, as well as counterclaims for a declaratory judgment of noninfringement, invalidity, and unenforceability of the '012 patent. Inliner also filed a counterclaim for tortious interference with contractual relations which included the assertion that "Insituform has successfully monopolized the market for soft-lining sewer rehabilitation in the United States for many years." The counterclaim did not, however, refer to the federal antitrust laws, nor was there a separate counterclaim alleging antitrust violations.

On March 5, 1991, almost a year after Insituform had filed its answer and counterclaims, the district court filed an order indicating that, *inter alia*, "defendants' counterclaim for

---

[3] "Insituform" is a collective reference to three separate plaintiffs: Insituform Technologies, Inc.; Insituform (Netherlands) B.V.; and Insituform Gulf South, Inc.

antitrust violations is severed."[4] Shortly thereafter, Inliner entered a motion to amend its counterclaims so as "to include specific allegations regarding Insituform's antitrust violations." The district court did not take any immediate action on Inliner's motion.

In June 1991, the patent and state law issues in the case were tried to a jury for two weeks. At the close of the trial, the jury returned verdicts of infringement, no invalidity, no inequitable conduct, and no tortious interference with contract. Although the jury was instructed on both literal infringement and infringement under the doctrine of equivalents, the interrogatory form asked only whether "Inliner made, used, or sold a method that infringes claim one of the '012 patent," *i.e.*, for a general infringement verdict. Inliner moved for JNOV on all issues. By order dated August 28, 1991, the court granted the JNOV motion in part, concluding that Inliner had not literally infringed the '012 patent and that it was entitled to retrial on the question of infringement under the doctrine of equivalents. The court denied Inliner's motion with respect to the jury's verdict of no invalidity, thus leaving that verdict intact.

In February 1995, the claim of infringement under the doctrine of equivalents was retried, this time to the bench, for three days.[5] On October 11, 1995, the district court denied Inliner's motion to amend its allegedly severed counterclaims. In November 1995, the district court entered amended findings of fact and conclusions of law, according to which two of Inliner's processes were found to have infringed under the doctrine. At that time, the court also explained that its earlier reference to the severance of an antitrust counterclaim had been "erroneous[ ]," inasmuch as no such counterclaim had ever existed.

---

[4] Because no such counterclaim existed, the court's order is difficult to comprehend as anything other than a mistake.

[5] In 1995, the case was reassigned from Judge Hughes, who had presided over the first trial, to Judge Gilmore, who tried the question of infringement under the doctrine of equivalents.

Inliner appeals from the district court's (1) August 28, 1991 order denying its motion for post-verdict JNOV of invalidity of the '012 patent, (2) October 11, 1995 order denying its motion to amend the counterclaims, and (3) final decision finding infringement under the doctrine of equivalents despite Inliner's alleged prosecution history estoppel defense. Insituform cross- appeals from the district court's August 28, 1991 order granting Inliner's motion for post-verdict JNOV of no literal infringement of claim 1 of the '012 patent.

We write solely on the questions of infringement, both literal and by equivalency, of the '012 patent. Of the issues raised by the parties, only these infringement issues merit extended analysis. The jury's rejection of Inliner's attack on the validity of the '012 patent is amply supported by the evidence, and we discern no error in the district court's denial of Inliner's motion for post-verdict JNOV on this point. The district court's eventual denial of Inliner's 1991 motion to amend its "antitrust" counterclaim was not, as Inliner contends, an abuse of discretion, inasmuch as no "antitrust" counterclaim in need of amending ever existed. The district court's decisions on these two points are straightforward, and we affirm them without further discussion. Because the district court's grant of Inliner's motion for post- verdict JNOV of no literal infringement is consistent with the proper construction of claim 1 of the '012 patent, we affirm that grant. Although the district court properly determined that the prosecution history of the '012 patent did not estop Insituform from claiming infringement by the accused processes under the doctrine of equivalents, we vacate the district court's decision that Inliner infringed under the doctrine in light of Judge Gilmore's reliance on a claim construction that is incorrect as a matter of law.

BACKGROUND

The Technology

Underground pipes, such as sewer pipes, are subjected to great stress. As a result, over time, the pipes develop cracks and other structural defects. Before the development of the

technology involved in the case at bar, the only way to rehabilitate a section of underground pipe was to dig up the broken portion and replace it.

Eric Wood, an inventor at Insituform, pioneered a process for rehabilitating a sewer or other underground pipe without digging it up. Specifically, in the process developed by Wood, one inverts within the pipe a flexible tubular liner comprising an impermeable plastic layer and a thick, resin-impregnated felt layer, such that the resin-impregnated felt layer is held against the inner wall of the pipe. The resin used to impregnate the felt is thermosetting; in other words, although soft while at "room" temperature, the resin hardens permanently when exposed to heat. After the tubular liner has been put in place--plastic layer facing in, felt side facing out--and pressed out to conform to the pipe under repair, hot water is pumped through the lining to harden the resin.

Early in the development of this technology, artisans learned that they could facilitate the impregnation process, as well as make the resulting impregnation more thorough, by drawing air from the interior of the felt tube during impregnation. In general, the processes at issue in the case at bar all involve (a) a tube of felt with an impermeable outer layer, (b) into which is placed a "slug" of resin large enough to impregnate fully that length of tubing, (c) after which the tube is drawn through squeezing rollers, (d) while a vacuum is drawn through at least one opening somewhere downstream of the "resin front."

The Everson Prior Art Patent

U.S. Patent No. 4,182,262 to Everson ("the Everson patent") issued in January 1980. It teaches both an apparatus and method for impregnating the felt lining of a flexible tube with resin *at the repair site*, thus eliminating the need to transport heavier, already-impregnated tubing to the site. Col. 1, ll. 15-63. The preferred embodiment includes a vacuum pump that is attached, by means of a hose, to the far end of the length of tubing to be impregnated. Col. 6, l. 65--Col. 7, l. 8. The specification describes the drawing of the vacuum during

impregnation as follows:

> As the tube passes through the throat [between the conveyor belt and the first roller], it is flattened therein and the resin in the bulge is spread transversely of the frame from side to side within the tube. As the conveyor transports the tube through the apparatus, the tube passes through the flattener commencing at the leading end so that the resin is extruded along the tube toward said opposite end. When the tube is engaged in the throat, the motor driving the vacuum pump is energized, creating a negative pressure in the reservoir, the hose, and the end of the tube opposite the leading end. The impervious outer lamina [of the tube] minimizes intrusion of air into the tube so that an effective vacuum can be maintained. The negative pressure urges the fluid resin to flow within the tube toward said opposite end. The combined action of the flattener and the vacuum system thus cause[s] the resin thoroughly to impregnate the absorbent lamina of the length of the tube required to line the passageway.

Col. 9, ll. 1-19 (diagram reference numbers omitted).

Claim 1 of the Everson patent recites an apparatus corresponding to the preferred embodiment in "means plus function" terms. Claim 2 recites "[t]he apparatus of claim 1 having a source of vacuum connected to the end of the tube opposite said leading end thereof, whereby the fluid material is urged to flow within the tube toward said end thereof opposite to the leading end." Col. 10, ll. 40-44. Claim 3, like claim 1, recites an apparatus, but includes a limitation reciting "vacuum means communicating with the [far] end of [the] tube" to be impregnated. Col. 10, ll. 52-53.

In short, Everson teaches attaching the vacuum to the tube to be impregnated at only *one* place--the end opposite the resin-containing leading end--and applying that vacuum *continuously* throughout the impregnation process.

The Patent in Suit

Eric Wood filed the application that matured into the '012 patent in February 1981.[6] The only prior art reference Wood cited was the Everson patent. The application included the following description of an innovative manner of applying a vacuum, or negative pressure, to the tube:

> The vacuum may be applied through a window in the film in the wall of the tube by means of a cup applied to said window and connected to a source of vacuum by means of a flexible hose, whereby the cup can move with the tube during its movement relative to said nip. As each section of the tube has its resin absorbent material thus impregnated with resin, the cup may be moved and applied to a position spaced downstream from the previous window, the said previous window being sealed by means of a patch or the like, whereby the process is repeated for respective lengths of the tube until the entire tube length has been impregnated.

Later, in connection with describing the drawings accompanying the application, Wood offered the following account of applying the vacuum cup to the tube:

> A vacuum source is provided, and a vacuum cup is connected to the vacuum source by means of a flexible hose. The vacuum cup is applied to the outside of the lining tube, downstream of the mass of resin inside the tube ... the vacuum cup being in register with a window made in the outer membrane of the lining tube, so that the vacuum applied to the interior of the cup can be applied to the interior of

---

[6] Insituform (Netherlands) B.V. is the owner of the '012 patent. Insituform Technologies, Inc. is the exclusive licensee and has granted a sublicense to Insituform Gulf South, Inc.

> the lining tube, whereby air is drawn from the inside of the tube to permit the effective and efficient impregnation of the absorbent material with the resin....
>
> Fig. 11 shows the impregnation process at a midway position, and it should be mentioned that when one section of the impregnation of the tube has been completed, the suction cup is removed to a downstream location whereat a further window is formed, the previous window having been sealed by means of a patch of a material compatible to the material of the coating, the patch being suitably sealingly bonded to the coating material. The vacuum cup is therefore applied at intervals during the impregnation process, until complete impregnation of the resin absorbent material has been achieved.

(Diagram reference numbers omitted).

As initially filed, the Wood application contained nine claims, only four of which are relevant to this appeal. The original four claims with relevance to this dispute are as follows:

> 1. A method of impregnating a flexible tube comprising an inner layer of resin absorbent material and an outer layer in the form of an impermeable film, wherein the resin absorbent layer is impregnated with a curable resin by applying a vacuum to the inside of a flexible tube whilst the resin is brought into impregnation contact with the resin absorbent material, the impermeable film serving as a means to prevent ingress of air into the interior of the tube, whilst the impregnation process is taking place.
>
> 2. A method according to claim 1, wherein the resin is introduced into one end of the tube in a quantity calculated effectively to impregnate all of the resin absorbent material of the tube, and the

> vacuum is applied to the interior of the tube, downstream of the resin mass, so that the resin will tend to flow towards the vacuum application region.
>
> 3. A method according to claim 2, wherein the lining tube containing the mass of resin is fed through a pressure applying nip, such as may be defined by a nip roller, which, together with the movement of the tube, squeezes the resin in a direction towards the region of the application of the vacuum, at the same time flattening the tube and assisting in the even distribution of the resin.
>
> 4. A method according to claim 2, wherein the vacuum is applied through a window in the film in the wall of the tube by means of a cup applied to said window and connected to a source of vacuum by means of a flexible hose, whereby the cup can move with the tube during its movement relative to said nip, the cup being moved and applied to a position spaced downstream from the previous window, said previous window being sealed by means of a patch or the like, whereby the process is repeated for respective lengths of the tube until the entire tube length has been impregnated.

The examiner rejected these claims in light of the Everson patent, specifically stating that "[c]laims 1-6 are rejected under 35 USC 103 as unpatentable over Everson et al. The claimed process does not appear to differ in any unobvious aspect from that of the reference." In response, Wood canceled the original claims and submitted three new claims that recited in new form the limitations of original claims 4 through 6. In so doing, Wood submitted the following argument:

> The principal reference relied on in the rejection of claims 1 to 6 is the patent to Everson (U.S. 4,182,262). Everson's method is ineffective when dealing with long lengths of tube because that method requires an exceedingly large suction

> compressor. Applicant's method solves the problem of impregnating long lengths of tubing by forming a window in the tube's impermeable skin, drawing the resin to the region of the window by a vacuum while squeezing the tube to force the resin to flow toward the evacuated region, sealing the window, and repeating the process at another window farther downstream. Thus by iterating and reiterating that process, the resin is drawn along to impregnate the entire length of the tube.
>
> It is submitted that applicant has taught an improvement upon Everson's method which makes feasible the impregnation of long tube lengths and that the grant of a patent on that improvement is merited.

The examiner then allowed the claims without further argument or comment and the '012 patent issued on December 28, 1982. Claim 1, the only claim in suit, is as follows:

> 1. A method of impregnating with a curable resin an inner layer of resin absorbent material disposed in an elongate flexible tube having an outer layer formed by an impremeable [sic] film, the method comprising the steps of
>
> (1) introducing into one end of the elongate tube a mass of the curable resin sufficient to impregnate the entire resin absorbent inner layer of the tube,
>
> (2) forming a window in the impermeable outer layer of the tube at a distance from said one end of the tube,
>
> (3) drawing through the window a vacuum in the interior of the tube downstream of said one end by disposing over the window a cup connected by a flexible hose to a vacuum source which cup prevents ingress of air into the interior of the tube while the tube is being

evacuated, the outer layer of the tube being substantially impermeable to air,

(4) beginning at or near the end at which the curable resin mass was introduced, passing the tube between squeezing members which force the resin to flow towards the region of vacuum application as the tube progresses through the squeezing members,

(5) when the resin reaches the vicinity of the region of vacuum application, removing the cup and sealing the window,

(6) providing another window in the impermeable layer of the tube downstream of the previously formed window,

(7) drawing through the new window a vacuum in the interior of the tube while progressively moving the tube through the squeezing members to force the resin to flow toward the new region of vacuum application, and

(8) repeating steps 5, 6, and 7, where necessary to impregnate the entire resin absorbent inner layer of the flexible tube.

Col. 6, l. 37--Col. 7, l. 6.

The Accused Process

Inliner engages in two processes which are at issue here. Both processes result in continuous vacuums.

In "Process 1" or "the Multiple Cup Process," from four to six cups are used to draw a vacuum from a corresponding number of slits in the tube. As a result, when the cup closest to the advancing resin is removed, and the slit beneath it sealed, the remaining downstream cups continue to draw a vacuum in the tube.

In "Process 2" or "the Multiple Needle Process," the

multiple cups are replaced by multiple metal tubes. The metal tubes, known as needles, are inserted through the layers of the impregnated tube, rather than merely placed over holes in the wall of the impregnated tube. Inliner did not develop Process 2 until 1991, after the first phase of the case had already been tried to a jury.

ANALYSIS

Literal Infringement

Insituform cross-appeals from the district court's grant of Inliner's motion for JNOV of no literal infringement. According to Insituform, JNOV was improper because "*[e]ach* of defendants' [vacuum] cups 1, 2, 3, etc. is manipulated precisely as called for in the claim, thus constituting multiple infringements."

We review *de novo* the correctness of a grant of a JNOV by reapplying the JNOV standard. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 975, 34 USPQ2d 1321, 1326 (Fed.Cir.1995) (in banc), *aff'd*, --- U.S. ----, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). Thus, as the district court was required to do upon Inliner's motion for JNOV, we

> must determine whether there exists evidence of record upon which a jury might properly have returned a verdict in [the non-movant's] favor when *the correct legal standard is applied.* If there is not, [the movant] was entitled to have the question removed from the jury and decided as a matter of law.

Markman, 52 F.3d at 975, 34 USPQ2d at 1326 (quoting *Jamesbury Corp. v. Litton Indus. Prods., Inc.*, 756 F.2d 1556, 1560, 225 USPQ 253, 257 (Fed.Cir.1985)). In so determining, we must uphold factual findings made by the jury unless there is a lack of substantial evidence to support a finding in favor of the nonmovant. *Id.* On the other hand, we must consider *de novo* whether the legal standards applied by the jury are correct as a matter of law. *Id.*

[1] Here, we are asked to determine whether there is

substantial evidence to support the jury's finding that Inliner literally infringed Insituform's patent. An infringement analysis consists of two steps: interpreting the claims in a patent to determine their scope and meaning and comparing the properly construed claims to the accused product or process. *Id.* at 976, 34 USPQ2d at 1326.

Here, the entire analysis turns on the proper claim construction. That is because the underlying issue of claim construction is whether claim 1 should be construed to be literally limited to a process using one and only one vacuum cup, as asserted by Inliner. If so limited, the claim is also inherently limited to a process where the drawing of the vacuum inside the tube is discontinuous, i.e., interrupted by the moving of the cup from window to window. Such a claim cannot be infringed by Process 1, because that process maintains a continuous vacuum.

[2][3] Claim construction is a question of law which we review *de novo*. *Id.* at 979, 34 USPQ2d at 1329. In construing claim 1, we look first to the intrinsic evidence of record, namely the language of the claim, the specification and the prosecution history. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1576 (Fed.Cir.1996). Looking first to the claim language, we note preliminarily that Insituform has conceded that claim 1 contains no terms that have a specialized or technical meaning. Furthermore, nothing in the text of claim 1 suggests the use of more than one cup. Specifically, claim 1 refers to "a cup" and "the cup" repeatedly, suggesting that only one cup is involved. Indeed, rather than describing the process in terms of more than one cup, claim 1 specifically describes using the same cup repeatedly. Also, claim 1 uses the phrase "region of vacuum application" in a manner indicating that only one such region exists at any given time. This use of the phrase "region of vacuum application" is thus inconsistent with the use of more than one cup at any given time, as each cup creates its own associated region of vacuum application. Likewise, it is also inconsistent with the creation of a continuous, rather than discontinuous, vacuum.

Turning to the text of the specification, we note that neither the specification nor the drawings disclose the use of more than one cup. For example, the specification states:

> The vacuum may be applied through *a window* in the film in the wall of the tube by means of *a cup* applied to said window ... whereby *the cup* can move with the tube.... As each section of the tube has its resin absorbent material thus impregnated with resin, *the cup* may be moved and applied to a position spaced downstream from the previous window....
>
> Col. 2, ll. 30-35 (emphasis added).
>
> A vacuum source is provided, and a *vacuum cup* is connected to the vacuum source by means of a flexible hose. *The vacuum cup* is applied to the outside of the lining tube downstream of the mass of resin inside the tube....
>
> Col. 5, ll. 61-65 (emphasis added, diagram reference numbers omitted).
>
> [W]hen one section of the impregnation of the tube has been completed, *the suction cup* is removed to a downstream location.... *The vacuum cup* is therefore applied at intervals during the impregnation process, until complete impregnation of the resin absorbent material has been achieved.
>
> Col. 6, l. 14-24 (emphasis added, diagram reference numbers omitted).

Likewise, the drawings of the '012 patent, specifically figures 10 and 11, show only a single vacuum cup.[7]

---

[7] Although Insituform's own witnesses confirmed this interpretation of the claim, we need not give such testimony any weight, as the intrinsic evidence alone is sufficient to resolve any ambiguity in the claim. *See Vitronics*, 90 F.3d at 1584, 39 USPQ2d at 1578.

[4] In light of the language found in the claims, specification and file history, we conclude the only correct and indeed the reasonable interpretation of claim 1 limits the scope of that claim to a process using only one vacuum cup which inherently creates a discontinuous vacuum. Indeed, as Insituform concedes in its brief, "[t]here is no question but that the patent discloses a single vacuum cup which draws a vacuum at one point and then, when the resin front approaches, is removed from its initial position and repositioned to draw vacuum at its new downstream position." Thus, in light of the fact that Inliner's processes both create a continuous vacuum, neither can literally infringe.

Insituform argues that such an interpretation places too much weight on the distinction between drawing a vacuum and the evacuated state that exists within the tube, even as a cup is moved from one window to another. According to Insituform, "it is not the continuity of *drawing* the vacuum which is important but rather the continuity of *having* an effective vacuum where the resin meets the portion of the felt to be impregnated." However, such attorney argument cannot control in light of the language of the claim. Claim 1, and more specifically steps 3 and 7, is cast in terms of "drawing a vacuum," not merely having a vacuum.

[5] Insituform also argues that claim 1 requires only "manipulating the suction cup (or its equivalent) in a particular fashion," that each of the cups used in Process 1 is manipulated in such a fashion, and that "adding something to an infringement [i.e., more than one cup] does not avoid infringement." However, as discussed above, we believe that claim 1 must be construed as reading only on a one cup, discontinuous vacuum process. While adding elements may, in certain instances, fail to prevent a finding of infringement, it will prevent a finding of literal infringement where, as here, the claim is specific as to the number of elements (one cup) and adding elements eliminates an inherent feature (discontinuous vacuum) of the claim.

In light of our conclusion that claim 1 must be construed to literally cover a process using only one cup, and thereby literally cover only a process using a discontinuous vacuum, and the complete lack of evidence indicating Inliner's Process 1 uses only a single cup, there was no evidence upon which the jury could have reasonably returned a verdict in Insituform's favor when applying the correct claim construction, and the district court's grant of JNOV was proper. We therefore affirm the district court's JNOV of no literal infringement.

Infringement Under the Doctrine of Equivalents

[6] Although we conclude the district court correctly granted JNOV in favor of Inliner on the issue of literal infringement, that does not end our analysis. Infringement may still be established under the doctrine of equivalents if there is "proof of insubstantial differences between the claimed and the accused products or processes." *Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512, 1522, 35 USPQ2d 1641, 1648 (Fed.Cir.1995) (in banc), *cert. granted*, --- U.S. ----, 116 S.Ct. 1014, 134 L.Ed.2d 95 (1996). This determination is a question of fact and, when made by the trial court, reviewable for clear error. *Hilton Davis*, 62 F.3d at 1521, 35 USPQ2d at 1647.

[7][8] The doctrine of equivalents, however, is subject to the doctrine of prosecution history estoppel, which acts to limit infringement by otherwise equivalent products or processes. *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1218, 36 USPQ2d 1225, 1230 (Fed.Cir.1995). Prosecution history estoppel bars the patentee from recapturing subject matter that was surrendered by the patentee during prosecution in order to promote allowance of the claims. *Mark I Mktg. Corp. v. R.R. Donnelley & Sons*, 66 F.3d 285, 291, 36 USPQ2d 1095, 1099-1100 (Fed.Cir.1995), *cert. denied*, --- U.S. ----, 116 S.Ct. 917, 133 L.Ed.2d 847 (1996); *Pall Corp.*, 66 F.3d at 1211, 36 USPQ2d at 1230. The application of prosecution history estoppel is a question of law subject to *de novo* review. *See Mark I*, 66 F.3d at 291, 36 USPQ2d at 1100.

The district court held that Process 1 and Process 2 did not differ substantially from the process disclosed in the '012 patent. In so holding, the district court rejected Inliner's prosecution history estoppel argument stating,

> There is nothing in the file history of the '012 patent or the prior art which prevents claim 1 from covering Defendants' processes. The patentee originally claimed, in claim 1, all types of vacuum application, and in claim 4 he originally claimed the sequential application of vacuum. The prior art cited by the Examiner did not show that sequential vacuum application, and by amending the claims, the patentee abandoned protection broad enough to include all types of vacuum application but properly retained claims to sequential vacuum application, which is precisely what Defendants do in all of their processes.

Inliner contends that Insituform is precluded by "classical prosecution history estoppel" from asserting that the right to exclude extends broadly enough to cover Inliner's Process 1 or Process 2. According to Inliner,

> During the prosecution of the '012 patent application, Mr. Wood attempted to obtain broad claim coverage covering all vacuum application methods, whether the drawing of a vacuum was continuous or discontinuous.... Mr. Wood abandoned this broad coverage and settled for significantly less, claims limited to a single cup, inherently interrupted drawing of vacuum.... Therefore, Insituform is now estopped to assert a range of equivalents that was disclaimed during prosecution. Specifically, Insituform is estopped from covering a method that continuously draws vacuum from the liner.

We do not agree with Inliner's contentions.

[9] In examining the prosecution history in an estoppel analysis, we do not look to the subjective intent of the

applicant and what the applicant subjectively believed or intended that he or she was giving up to the public.[8] Rather, the standard for determining what subject matter was surrendered is objective and depends on what a competitor, reading the prosecution history, would reasonably conclude was given up by the applicant. *Mark I*, 66 F.3d at 291, 36 USPQ2d at 1100; *see also Haynes Int'l, Inc. v. Jessop Steel Co.*, 8 F.3d 1573, 1578, 28 USPQ2d 1652, 1656 (Fed.Cir.1993) ("The legal standard for determining what subjective matter was relinquished is an objective one, measured from the vantage point of what a competitor was reasonably entitled to conclude, from the prosecution history, that the applicant gave up to procure issuance of the patent."); *Prodyne Enter., Inc. v. Julie Pomerantz*, 743 F.2d 1581, 1583, 223 USPQ 477, 478 (Fed.Cir.1984) ("Prodyne is *estopped* from now broadening the description of a claim element limited during prosecution so as to encompass a structure which a competitor should reasonably be entitled to believe is not within the legal boundaries of the patent claims in suit.").

[10] As noted above, the Insituform application originally contained four claims relevant to the instant dispute. Original claims 1 and 2 were broadly drafted and would likely have read on a process using a single cup or a single needle at any location downstream of the resin, multiple cups or multiple needles at any location downstream of the resin, or continuous vacuum or discontinuous vacuum created at any location downstream of the resin. Claim 3 was also drafted broadly and would have likely read on both continuous vacuum or discontinuous vacuum created at any point along the tube

---

[8] This is not to say that we do not examine the purpose of the statements made to the PTO. Thus, for example, "a concession made or position taken to establish patentability in view of prior art on which the examiner has relied, is a substantive position on the technology for which a patent is sought." *Pall Corp.*, 66 F.3d at 1220, 36 USPQ2d at 1231. On the other hand, "when claim changes or arguments are made in order to more particularly point out the applicant's invention [*e.g.*, in response to a rejection under 35 U.S.C. § 112], the purpose is to impart precision, not to overcome prior art." *Id.*

downstream of the resin. Original claim 4 was the narrowest. The claims were rejected over Everson, which discloses both the use of a continuous vacuum and the creation of that vacuum from only a single vacuum source at the far end of the tube opposite the resin source.

In response, Insituform canceled the claims and filed new, narrower claims, including what is now claim 1, which, as we held above, is literally limited to the use of one vacuum cup which inherently creates a discontinuous vacuum. However, in its statement to the PTO, Insituform specifically noted that the problem with Everson was that "Everson's method is ineffective when dealing with long lengths of tube because that method requires an exceedingly large suction compressor." The need for an exceedingly large suction compressor occurred because the Everson suction compressor was located at the far end of the tubing. Insituform solved this problem by placing the suction source closer to the resin front, thus allowing the use of a smaller suction compressor. Thus, Insituform unequivocally gave up coverage to a process in which a single vacuum source is located at the far end of the tube.

It is true that, in explaining its amendments, Insituform discussed the use of a single vacuum source which was to be moved along the tube as the resin front advanced. This suggests that Insituform envisioned the use of a discontinuous vacuum created sequentially by only one vacuum source. However, this statement alone is too equivocal to be read as a statement which would estop Insituform from equivalently covering a number of small compressors spread along the tube creating a continuous vacuum. The prosecution history makes clear that the problem to be solved was the need for a large compressor when the vacuum was created a significant distance from the resin source. The use of one vacuum source repeatedly moved down the tube as the resin advances and the use of a number of vacuum sources spread along the tube so that one is always near the advancing resin both solve the problem presented by Everson by placing the vacuum source close to the resin, thereby allowing the use of a smaller vacuum source.

Although a patentee's "unmistakable assertions" to the PTO in support of patentability will estop the patentee from obtaining coverage over surrendered material, *Athletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1582, 37 USPQ2d 1365, 1373 (Fed.Cir.1996) (citing *Kinzenbaw v. Deere & Co.*, 741 F.2d 383, 389, 222 USPQ 929, 933 (Fed.Cir.1984)), here, however, it cannot be said that a reasonable competitor could conclude that Insituform relinquished coverage of processes using either multiple vacuum sources or a continuous vacuum. At no point did Insituform indicate that the Everson problem could be solved only in the manner used by Insituform, *i.e.*, Insituform never stated that the problem could not be solved by using more than one vacuum source or a continuous vacuum. Rather, the only express limitation put on the invention by Insituform was the use of a vacuum source close to the resin. Thus, in light of the equivocal nature of Insituform's statements, no reasonable competitor could conclude that Insituform gave up coverage of continuous vacuum created by one or more vacuum sources. We therefore conclude that the prosecution history does not estop Insituform from asserting that the right to exclude extends broadly enough to cover either Process 1 or Process 2.

[11] We cannot, however, uphold the district court's finding of infringement under the doctrine of equivalents because it is based on an incorrect claim construction. Although Judge Hughes used the correct claim construction in concluding that Inliner had not literally infringed, Judge Gilmore appears to have applied a different and incorrect claim construction in concluding that there was no infringement under the doctrine. Specifically, in reaching her decision regarding this issue, Judge Gilmore noted that: (1) "[n]owhere in the claim is the licensee restricted to the use of one cup"; (2) the claim was silent regarding "whether the vacuum in the liner is continuous or not"; and (3) the vacuum in the patented invention is continuous. Thus, as the district court's doctrine of equivalents analysis was distorted by its incorrect claim construction, we must remand for new findings regarding this issue in accordance with the correct claim construction, *e.g.*, whether the use of many cups is equivalent to the use of one cup,

whether a needle is equivalent to a cup, and whether the use of a discontinuous vacuum is equivalent to the use of a continuous vacuum.

[12] We note also that, on remand, the district court should strive to avoid the conceptual misunderstanding perhaps present in some of our case law. Namely, it is incorrect to refer to a claim as being expanded or enlarged when infringement is found under the doctrine of equivalents. *Wilson Sporting Goods Co. v. David Geoffrey & Assoc.*, 904 F.2d 677, 684, 14 USPQ2d 1942, 1948 (Fed.Cir.1990) ("To say that the doctrine of equivalents extends or enlarges *the claims* is a contradiction in terms. The claims--i.e., the scope of patent protection *as defined by* the claims--remain the same and application of the doctrine *expands the right to exclude* to "equivalents" of what is claimed.") (emphasis in original).

AFFIRMED-IN-PART, VACATED-IN-PART AND REMANDED.

COSTS

Each party to bear its own costs.

Appendix B

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V., AND INSITUFORM GULF SOUTH, INC.,	§	
Plaintiffs,	§	
v.	§	CIVIL ACTION
	§	NO. H-90-1690
CAT CONTRACTING INC., MICHIGAN SEWER CONSTRUCTION COMPANY, KANAL SANIERUNG HANS MULLER GmbH & CO. KG, AND INLINER U.S.A.,	§	
Defendants.	§	

SECOND AMENDED FINDINGS OF FACT AND CONCLUSIONS OF LAW

FINDINGS OF FACT

Procedural History

1. In February 1990, Defendants were sued for infringement of U.S. Patents 4,009,063 of February 22, 1977 and 4,336,012 of December 18, 1982, both the inventions of Eric Wood and both now owned by Insituform Technologies, Inc.

2. In 1991, there was a jury trial of the issues of infringement and validity of the '063 and '012 patents. The jury returned a verdict finding validity and infringement as to both patents.

3. Defendants moved for judgment notwithstanding the verdict or new trials on to all issues. Judge Hughes granted Defendants' JNOV motions with respect to literal infringement of both patents, ordered a new trial with respect to the issue of infringement by the doctrine of equivalents of both patents, and denied Defendants' motion in all other respects.

4. Trial of the issues of recoverable damages as against each defendant has been bifurcated, and is not here involved, nor was it involved in the 1991 trial.

5. The '063 patent expired February 22, 1984. The parties have stipulated that it is no longer involved in this lawsuit.

Parties and Jurisdiction

6. Plaintiff Insituform (Netherlands) B.V. ("Insituform") is a corporation of the Netherlands, with a principal place of business at Herengracht 552, Amsterdam 1001, Netherlands. Insituform Technologies, Inc. ("ITI") is a Delaware corporation, having a principal place of business at 3315 Democrat Road, Memphis, Tennessee 38118. Insituform Gulf South, Inc. ("INS") is a Texas corporation, having a principal place of business at 131 North Richey, Pasadena, Texas 77506.

7. Defendant Cat Contracting, Inc. ("CAT") is a Michigan corporation, having its principal place of business at 2022 FM 528, Alvin, Texas, 77518. Michigan Sewer Construction Company ("Michigan Sewer") is a Michigan corporation, having a principal place of business at 21720 West Eight Mile Road, Southfield, Michigan 48075. Kanal Mueller Gruppe International (KMG) is a corporation of the Federal Republic of Germany, having a place of business at 4938 Schieder-Schwalengerg, Federal Republic of Germany. Kanal Sanierung Hans Mueller GmbH & CO KG ("KM"), is a licensee of KMG for the country of Germany. Inliner U.S.A. ("Inliner") is a corporation of the State of Delaware, having a principal place of business in Houston, Texas.

8. This Court has jurisdiction over the parties and the subject matter of this case 28 U.S.C. §§ 1331, 1338(a), 2201

and 2202. Venue is proper in the Southern District of Texas. 28 U.S.C. §§ 1391 and 1400.

Background

9. Sewer pipes and the linings of sewer pipes are subjected to stresses. That is particularly true in the case of underground sewer pipes. It is necessary that the lining be capable of withstanding those stresses for an appreciable period of time, as long as 50 years.

10. To accommodate those requirements, Eric Wood, through Insituform, pioneered a process in which the soft liners are made up of a relatively thick layer of felt which is impregnated with a thermosetting resin. (A thermosetting resin is a resin which, when subjected to heat, will become hard but which, before the heat is applied, is soft.) After the felt liner has been put in place within the pipe to be repaired and has been pressed outwardly so as to conform to the pipe, the resin is heated, by flowing hot water through the lining, causing the resin to set. The strength of the lining thus produced is primarily dependent upon the set resin which has impregnated the lining. It is essential, if the lining is to have the desired strength and longevity, that the impregnation of the felt by the resin be substantially uniform.

11. Soft linings of the type in question are inserted in lengths that are usually many hundreds of feet long. When such linings are impregnated with resin they weigh many tons. Some jobs have involved the use of as much of 100 tons of resin. The felt that is used is quite dense and it is difficult to get the resin into the felt and ensure that the felt is substantially fully impregnated by the resin. A way needed to be found to achieve a substantially complete impregnation of felt linings of the size involved with the understanding that the presence of any substantial amount of air in the liner after impregnation would be unacceptable.

12. The major impediment to uniform impregnation of the felt by the resin is the presence of air in the felt. The resin

must displace the air, and do so substantially completely, if the felt is to be uniformly and satisfactorily impregnated.

13. Early on in the development of this technology, it was learned that the impregnation process would be greatly facilitated if air were to be sucked from the interior of the felt tube. During the impregnation process, a method was utilized where a vacuum pump was connected at the far end for the lining and air was sucked out of the lining from that far end until a satisfactory vacuum was created in the lining. That is what is shown in Everson patent 4,182,262 of 1980 and in the British Rhys-Jones article of 1975. It took a very appreciable length of time before sucking air from the free end of the liner produced a satisfactory vacuum at the point in the liner where the resin was beginning to enter the felt (the "resin front"), and impregnation could not start until that had been accomplished. The lengths of the liners used at the time of Everson and Rhys-Jones were relatively short, however, so the length of time involved was marginally acceptable. As the length of the liners increased, the time needed to produce the desired vacuum at the resin front increased as the square of the distance involved -- a liner twice as long --, would need four times as much time, and a liner four times as long would need sixteen times as much time. It is to this problem that the patent in suit, 4,366,012 of December 28, 1982, is directed.

The Patent In Suit

14. When Mr. Wood filed the patent application, original claim 1 called broadly for the application of the vacuum while the impregnation process is taking place. Original claims 2 and 3 added to claim 1 that the resin was introduced into one end of the tube and fed down the tube by means of nip rollers and the vacuum was applied to the interior of the tube downstream of the resin mass. Original claim 4 added to the above that the vacuum was applied through a window formed in the wall of the tube by means of a cup connected to a source of vacuum, the cup moving with the tube during its movement relative to the nip rollers, and the cup being removed and applied to a position spaced downstream from the previous

window, the previous window being sealed by means of a patch or the like, whereby the process is repeated for respective lengths of the tube until the entire tube length has been impregnated.

15. The Patent Examiner, in his first action on the merits, rejected all of those claims on the basis of the Everson patent, the Examiner saying: "The claimed process does not appear to differ in any unobvious aspect from that of the reference."

16. In response, by amendment dated April 6, 1982, applicant cancelled the original claims and added the claims that appear in the patent. Patent claim 1 reads as follows:

> a. A method of impregnating with a curable resin an inner layer of resin absorbent material disposed in an elongate flexible tube having an outer layer formed by an impermeable film, the method comprising the steps of
>
> (1) introducing into one end of the elongate tube a mass of the curable resin sufficient to impregnate the entire resin absorbent inner layer of the tube,
>
> (2) forming a window in the impermeable outer layer of the tube at a distance from said one end of the tube,
>
> (3) drawing through the window a vacuum in the interior of the tube downstream of said one end by disposing over the window a cup connected by a flexible hose to a vacuum source which cup prevents ingress of air into the interior of the tube while the tube is being evacuated, the outer layer of the tube being substantially impermeable to air,
>
> (4) beginning at or near the end at which the curable resin mass was introduced, passing the tube between squeezing members which force the resin to flow towards the region of vacuum

application as the tube progresses through the squeezing members,

(5) when the resin reaches the vicinity of the region of vacuum application, removing the cup and sealing the window,

(6) providing another window in the impermeable layer of the tube downstream of the previously formed window,

(7) drawing through the new window a vacuum in the interior of the tube while progressively moving the tube through the squeezing members to force the resin to flow toward the new region of vacuum application, and

(8) repeating steps 5, 6, and 7, where necessary to impregnate the entire resin absorbent inner layer of the flexible tube.

17. Applicant explained the similarity of the new claim to the original application claim 4 to the Examiner as follows: "(Application) Claim 10 (ultimately patent claim 1) incorporates the substance of cancelled claims 1, 2, 3 and 4." Applicant's total argument to the Examiner as to the patentability of that claim was as follows:

> The principal reference relied on in the rejection of claims 1 to 6 is the patent to Everson (U.S. 4,182,262). Everson's method is ineffective when dealing with long lengths of tube because that method requires an exceedingly large suction compressor. Applicant's method solves the problem of impregnating long lengths of tubing by forming a window in the tube's impermeable skin, drawing the resin to the region of the window by a vacuum while squeezing the tube to force the resin to flow toward the evacuated region, sealing the window, and repeating the process at another window farther downstream. Thus by iterating and reiterating that

process, the resin is drawn along to impregnate the entire length of the tube.

It is submitted that applicant has taught an improvement upon Everson's method which makes feasible the impregnation of long tube lengths and that the grant of a patent on that improvement is merited.

Accordingly, reexamination of this application is requested.

18. Patent claim 2 covers the subject matter of original application claim 5, and reads as follows:

> 2. The method according to claim 1, further including the step of forming an initial air seal at the end of the flexible tube at which the mass of resin was introduced by closing off that end of the tube after introduction of the mass of resin and before vacuum is applied to the interior of tube to draw the resin toward the region of vacuum application.

19. Patent claim 3 covers the subject matter of original application claim 6, and reads as follows:

> 3. The method according to claim 1, wherein said outer later of the flexible tube is defined by a felt sheet coated with a synthetic resinous material that forms said film, the method further including the steps of
>
> (i) sewing together adjacent edges of the felt sheet to form the tube, and
>
> (ii) covering the resultant seam with a sealing strip that is impervious to air.

20. With these explanations and clarifications to the Examiner, the application was then allowed. U.S. Patent No. 4,366,012 ('012 Patent), entitled "Impregnation Process," issued to Eric Wood on December 28, 1982. Insituform is the

owner of the '012 patent. ITI is the exclusive licensee within the United States, and has granted a sublicense to INS for territory that includes the City of Houston. It is still in full force and effect, and for purposes of this proceeding its validity is established.

Background of Earlier Proceedings

21. In early 1989, after reading about KM's proprietary sewer rehabilitation technology in a trade magazine, Mr. Guilio Catallo, the president of CAT, contacted KM for the purpose of obtaining a license for that technology. In March 1989 he traveled to Europe to observe KM's process for impregnating and installing liners in underground sewer lines, and to negotiate a license from KM.

22. On March 17, 1989, Mr. Catallo signed a letter of intent with KM to license the technology. On March 21, he submitted a bid on behalf of CAT Contracting and Michigan Sewer to perform pipe rehabilitation services for the City of Houston, specifically, Wastewater Job Nos. 3907-12 and 3907-16, sometimes referred to as the "Sims Bayou Contracts." CAT/Michigan Sewer (a joint venture) submitted the low bid and was eventually awarded the contract.

23. During the bidding process, Mr. Catallo received a letter dated April 7, 1989 from Insituform's attorney, Mr. Harold James, notifying CAT and Michigan Sewer that if they practiced the process being utilized by KM, they would infringe U.S. Patents 4,009,063 ('063 patent) and 4,786,345 ('345 patent). The letter did not mention the '012 patent, nor was Mr. Catallo notified of the '012 patent until this lawsuit was filed.

24. On February 2, 1990, Plaintiffs filed an original complaint against Defendants in the Eastern District of Michigan, alleging infringement not only of the '063 and '345 patents, but also of the '012 patent. In May 1990 the case was transferred to the Southern District of Texas. The Plaintiffs filed an amended complaint in this court, realleging infringement of the '063 and '012 patents, but dropping charges relating to the

'345 patent. Defendants filed an answer, alleging that, among other things, the patents were not infringed.

25. In June 1991, after a two-week trial, a jury returned a verdict that included the finding that both patents were infringed. Defendants filed motions for new trial and judgement notwithstanding the verdict. In pertinent part, the Defendants argued that the evidence showed that Plaintiffs were legally estopped from construing claim 1 to cover Defendants' Multiple Cup Process ("Process 1," discussed in greater detail below), either literally or by the doctrine of equivalents.

26. In August 1991 this Court partially granted Defendants' motions, ordering a judgment notwithstanding the verdict on the issue of literal infringement of both patents, and granting a new trial on the issue of infringement under the doctrine of equivalents. The issue of damages had previously been bifurcated from the issue of infringement by order of the Court dated March 5, 1991. Although the March 5, 1991 order also erroneously referred to the bifurcation of the defendants' counterclaim for antitrust violations, the Defendant's motion for leave to amend to add a claim for antitrust violations was never granted, and has been subsequently denied by this Court.

27. In January 1995 Plaintiffs dismissed with prejudice their charges of infringement of the '063 patent, leaving as the only issue whether Defendants infringe the '012 patent under the doctrine of equivalents. In addition to the Multiple Cup Process (Process 1), the Plaintiffs are alleging that the Multiple Needle Process (Process 2) also infringes the '012 patent. Process 2 was not accused of infringement in the original trial, nor had Process 2 been disclosed by the Defendants at the time of the first trial.

Defendants' Accused Impregnation Processes

28. Defendants have carried out in this country or, in the case of KM, have induced the carrying out of processes for the rehabilitation of pipelines using a lining formed primarily of an appropriate thickness of felt impregnated with a

thermosetting resin, which lining when soft is inserted into the damaged pipe, urged out toward the pipe interior, and subjected to heat in order to set the resin. The strength of Defendants' linings, like that of plaintiffs' lining, depends upon the thickness of the lining and the substantially complete impregnation of the felt by the unset resin. Defendants have over the years varied the impregnation process that they employed, but in all of those processes the felt is in tubular form with an impermeable film on the outside, a mass of resin sufficient to impregnate a predetermined extensive length of the liner (sometimes the entire length of the liner) is introduced into the tube, an opening is made in the impermeable film at a predetermined distance from the resin, vacuum is drawn through that opening, the lining is caused to move through squeezing rollers located upstream of the resin mass, and when that resin mass, because of the movement of the lining through the squeezing rollers, approaches the opening through which suction is being exerted, that is to say, the vicinity of the region of vacuum application, the vacuum source is removed from that opening, the opening is sealed, a new opening is provided in the impermeable layer downstream of the resin, vacuum is drawn through the new opening, the lining being progressively continuously moved and the process is repeated for whatever number of times are required for the given length of lining and the amount of resin introduced.

29. There are three variations in the impregnation process carried out by Defendants. In one, which Mr. Catallo testified at the first trial was carried out about 20% of the time, the vacuum was applied by means of a single vacuum cup which remained in place throughout the impregnation process.

30. In a second process described at the first trial and here called Process 1 by Defendants, a plurality of vacuum cups (usually four) were simultaneously applied to a corresponding plurality of openings along the length of the liner. When the resin front approaches the region of vacuum application (the leading cup), it is removed and that opening is sealed, the second cup is removed and the first cup is put in its place, the third cup is removed and the second cup is put in its place,

and so on until finally the last cup is removed, a new opening is formed in the impermeable layer downstream of the last then-existing opening, and the last cup is placed over that new opening. The lining is moved continuously through the nip rollers as this goes on.

31. Since the first trial, Defendants have gone to a third process, here called Process 2 by Defendants, which modifies Process I in two respects. First, instead of using a vacuum cup, they use a tube (they call it a "needle") connected at one end to the vacuum pump with its other end penetrating the impermeable film and being exposed to the felt, vacuum being drawn through that tube. Second, instead of shifting all of the tubes when the first tube approaches the resin front, they leave tubes 2 and 3, etc. in place and when the first tube is removed and its hole sealed, that first tube is moved to a position downstream from the last tube, where it is caused to penetrate the lining and draw a vacuum.

32. In both of these multi-cup Processes 1 and 2, Defendants are removing the suction source (cup or tube) from the hole close to the resin front, sealing that hole, making a new opening downstream and applying the suction source (cup or tube) to that new hole, and continuing that procedure sequentially while the lining is continuously moving through the squeezing rollers and over the mass of introduced resin.

33. K-M also uses an impregnation process involving the sequential application of vacuum to the liner, which was demonstrated to Mr. Catallo when he visited Germany and before he commenced his activities complained of in this lawsuit. In that process an opening is formed relatively near the resin front and a vacuum cup is applied. When that opening approaches the resin front, a second opening is made downstream of the lining and a second vacuum cup is applied, the first vacuum cup is removed, the first opening is sealed, and the process is continued sequentially for as long as is appropriate.

The Function of the Vacuum

34. What the vacuum does in the impregnation process is ensure that there is as little air as possible in the felt at the resin front, where the resin is entering the felt. The presence of air elsewhere in the felt is of no direct significance. It is only the vacuum in the felt at the resin front which determines the degree to which impregnation of the felt by the resin occurs.

35. The felt before impregnation is quite dense, so that air flow through it is restricted. That is one reason why, when suction is exerted only from the far end of the liner, it takes many hours to produce an adequate degree of suction at the resin front, and that is why the suction process disclosed in the Everson and Rhys-Jones prior art references, while marginally practical when employed with relatively short and narrow linings, is totally impractical if employed with longer and wider linings such as are commonplace today.

36. When the suction source (cup or tube) approaches the resin front and is removed, exposing the opening through which suction had previously been drawn, air tends to enter the lining through that opening and reduce the degree of suction within the lining, and particularly at the resin front. However, it is only a matter of five second or less to remove the suction source and seal the opening, and during that time very little air enters the lining and reaches the resin front. Similarly, only a very few seconds is involved between making the second opening, through which air tends to enter, and covering that second opening with the suction source, and in practice only about 15-20 seconds is involved in the entire procedure of removing the section source, sealing the opening, making the new opening and applying the suction source to the new opening. During that time, the degree of vacuum at the resin front does decrease somewhat, but not to a material degree. In practice the impregnation process continues uninterrupted during that time, with the lining continuously moving forward at a constant speed and the resin continuously impregnating newly presented portions of the felt.

37. Hence, in the single-cup process disclosed in the '012 patent, while the act of sucking air from the liner is interrupted during the few seconds required to effectuate the shift in position of the suction cup, and the degree of suction at the resin front decreases as a result, there is always a sufficient degree of vacuum at the resin front to provide for effective substantially complete impregnation of the felt. The vacuum within the liner, and particularly the vacuum at the resin front, is not interrupted or discontinuous. It is variable, but to a degree which makes no difference insofar as substantially complete felt impregnation is concerned.

38. The claim of the patent calls for forming a window and disposing a cup over that window to create a vacuum. Nowhere in the claim is the licensee restricted to the use of one cup. Insituform and its licensees have used multiple suction cups spaced along the length of the liner for many years prior to Defendants' existence. Insituform licensees sometimes use the single-cup process, but more often the multiple-cup process, because the multiple-cup process more rapidly achieves the desired vacuum at the resin front when relatively wide or thick liners are being impregnated. The reason wide or thick liners call for multiple cups is that with them the cross-sectional area of the felt exposed to the resin is quite large, making the obtaining of an adequate vacuum more difficult. The more suction cups that are working at any one time the more rapidly is the requisite degree of vacuum achieved at the resin front. The shifting of cups in the multiple-cup process results in a lessening of the vacuum at the resin front, just as in the case of the single-cup process, but the difference in degree in either the single-cup or multiple-cup process is not material in the overall carrying out of the impregnation process.

39. The claim calls for "an outer layer formed by an impermeable film." The purpose and function of that outer layer is to keep the resin in the felt during the impregnation process. Defendants' processes involve the use of a plastic layer immediately outside the felt layer which is also impermeable during the impregnation process, and which keeps the resin in

the felt during the impregnation process. The function of the impermeable layer is to keep the resin in the felt layer during impregnation. The plastic layer performs this function in the claim 1 method performed by the Plaintiff and in the Process 1 and 2 methods performed by the Defendant even though the Defendant has a very thin felt layer on top of the impermeable layer.

40. Defendant has presented evidence to attempt to demonstrate the substantiality of the differences between the methods that they use in Processes 1 and 2 and the Plaintiff's method in Claim 1 of the patent to avoid a finding of infringement under the doctrine of equivalents. Defendants describe the substantiality of the differences as follows:

Multiple Cup Process (Process 1)

41. The Multiple Cup Process (Process 1) was based on KM's process used in Europe. It involves a process whereby a quantity of curable resin is introduced inside one end (the upstream end) of an elongated hose-like liner, which has felt as its outermost surface. A plastic layer is sandwiched between the outer felt layer and an inner felt layer. The liner is positioned along a tilted conveyer belt, causing the resin to flow downstream. Slits are formed 10-15 feet apart in the outer felt and plastic layer of the liner. Multiple vacuum cups (typically 4-6) are then positioned over the slits. A vacuum pump is connected to the cups by hoses. The cups apply vacuum simultaneously along the liner, to pull air from the inner felt layer, allowing the flowing resin to evenly soak or impregnate the inner felt.

42. Interruption of vacuum during the process is avoided by using the multiple cups to draw a continuous vacuum beyond the isolated region closest to the resin. The continuous vacuum zone extends approximately 30-50 feet along the liner. When the cup closest to the resin is removed, the remaining cups positioned farther downstream continue to draw vacuum on the inner felt. The presence of those cups insures that a continuous uninterrupted vacuum is maintained.

Multiple Needle Process (Process 2)

43. The Multiple Needle Process (Process 2) was developed by CAT in 1991 to replace Process 1. In Process 2, multiple hollow needles (typically 4-6), are positioned approximately 10-15 feet apart along the liner. Those needles apply a continuous vacuum to the liner.

44. A quantity of curable resin is introduced inside one end (the upstream end) of the elongated hose-like liner. As in Process 1, the outermost surface of the hose-like liner is made of felt, and the liner is positioned along a tilted conveyer belt, causing the resin to flow downstream.

45. Each needle is used to puncture the liner, such that the needle tip is positioned in the inner felt. The needles are inserted so that they point horizontally in the direction of the resin. Each needle is anchored to the liner, and is connected to the vacuum pump by a hose. When the vacuum pump is activated, the needles draw a vacuum from the inner felt through the tip of the needle. The needles apply vacuum simultaneously along the liner, to pull air from the inner felt layer, allowing the flowing resin to evenly soak or impregnate the inner felt.

46. A continuous uninterrupted vacuum is maintained at all times on the inner felt. When the resin approaches the first needle, that needle is removed and the hole sealed. When that needle is removed, the remaining needles positioned farther downstream continue to draw vacuum on the inner felt. Interruption of vacuum is avoided, since the needles continue to draw a vacuum beyond the isolated region closest the resin. The continuous vacuum zone extends approximately 30-50 feet along the liner.

Conclusory Findings

47. The Court has considered the evidence of the substantiality of the differences between Plaintiff's patent Claim 1 and the processes used by the Defendants. Defendants' Processes 1 and 2 do not differ substantially from the process disclosed in the '012 patent. They correspond in every detail to

claim 1 of the '012 patent, perform the same function (producing effective vacuum at the resin front) by the same means (sequential application of vacuum to the interior of the liner at points along the liner as the liner is moved) and achieve the same result (uniform impregnation of the felt by the resin).

48. Defendants' Process 1 is the full equivalent of the process described in claim 1 of the '012 patent. It does the same thing by the same means to accomplish the same result. That is true of claim 1 as a whole. With respect to the individual elements of claim 1, Defendants' Process 1 is the equivalent (same thing, same means, same result).

49. Defendants' Process 2 is the full equivalent of the process described in claim 1 of the '012 patent. It does the same thing, by the same means to accomplish the same result. The purpose, function and result of the cup, as claim 1 points out in section (3), is to "prevent(s) ingress of air into the interior of the tube while the tube is being evacuated", which is precisely the purpose, function and result of the tube. Both the cup and the tube are, as claim 1 states, "connected by a flexible hose to a vacuum source", both are the means provided for the application of vacuum, they both do the same thing (suck a vacuum) by the same means (being connected to a vacuum source) to achieve the same result (produce a satisfactory vacuum at the resin front).

50. The vacuum at the resin front when carrying out the multiple-cup Process 1 or multiple-needle Process 2 may be somewhat more efficient, during the time that the vacuum cups are being shifted, however, modification by the addition of multiple cups to the process to create this additional efficiency does not avoid infringement by equivalency because the multiple cups perform the same function in the same way to achieve the same results.

51. Neither does the substitution of the needle for the cup avoid infringement by equivalency because the mere modification of this feature does not avoid the fact that the basic features of Claim 1 of the patent have been adopted. This new

feature performs substantially the same function, in substantially the same way, to achieve substantially the same result. This apparatus distinction is irrelevant in the determination of whether the Defendants' processes infringe under the doctrine of equivalents.

52. There is nothing in the file history of the '012 patent or the prior art which prevents claim 1 from covering Defendants' processes. The patentee originally claimed, in claim 1, all types of vacuum application, and in claim 4 he originally claimed the sequential application of vacuum. The prior art cited by the Examiner did not show that sequential vacuum application, and by amending the claims, the patentee abandoned protection broad enough to include all types of vacuum application but properly retained claims to sequential vacuum application, which is precisely what Defendants do in all of their processes.

53. The patent claims say nothing about whether the vacuum in the liner is continuous or not. In fact, the vacuum in the liner, including the vacuum at the resin front, is continuous in the process disclosed in the '012 patent. The sucking of air from the liner is discontinued during the time involved in shifting the vacuum cup, but a substantial and operatively effective vacuum remains active on the resin front throughout the process.

CONCLUSIONS OF LAW

1. The Constitution of the United States authorizes Congress to enact laws to promote the progress of science and useful arts by granting inventors exclusive rights to their inventions for limited periods. These grants, known as "patents", serve the advancement of science because, after the grant period of seventeen (17) years expires, the invention is given to the public for free use by all. As part of the Department of Commerce, the United States Patent and Trademark Office was set up for the purpose of granting patents. It is made up of individuals with technical and legal training whose job it is to carefully review all applications of patents and to issue the patents when appropriate. Because patent

examiners have technical and legal expertise, their decisions as to patentability are given great weight. Congress has passed a statute which requires courts to respect the decisions of these experts by resolving doubts as to whether granted patents are valid in favor of the inventor. This is known as the "presumption of validity". United States Constitution, Article I, Section 8, Clause 8; Title 35 United States Code.

2. A patent has one or more claims. The claims measure the invention. Each claim defines a separate, independent invention. *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U.S. 405, 419, 52 L. Ed. 1112, 28 S. Ct. 748 (1908); *Ballantyne Inst. & Electronics, Inc. v. Wagner*, 345 F.2d, 671 (6th Cir. 1965).

3. Because the parent is presumed valid, to exercise the rights granted by the '012 patent, what the patent owner must do is prove that his patented invention is being used without his permission. This is called infringement. Plaintiff must prove infringement by a preponderance of the evidence. Once that is proved, the patent owner is then entitled to prevent further unauthorized use of the invention by means of an injunction, and to compensation for past unauthorized use. 35 U.S.C. 271, 283, 284; *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1054 (Fed. Cir. 1988) *cert. denied* 57 U.S.L.W 3281 (1988).

Infringement Generally

4. Whoever without authority makes, uses, or sells any patented invention within the United States during the term of the patent therefor, infringes the patent. 35 U.S.C. § 271. The party who asserts infringement has the burden of proving infringement by a preponderance of the evidence. *Braun, Inc. v. Dynamics Corp.*, 975 F.2d 815, 819 (Fed. Cir. 1992).

5. Infringement can be proved in either one of two ways. One way is by showing literal infringement. If Defendant's method falls clearly within the language of the claims, literal infringement is made out and that is the end of it. *Graver*

Tank & Mfg. Co. v. *Linde Air Products, Co.,* 339 U.S. 605, 607, 94 L. Ed. 1097, 70 S. Ct. 854 (1950).

6. One may avoid literal infringement by using the essence of an invention, but not duplicating it exactly. To overcome this problem, and preserve to inventors what is rightfully theirs, it is well settled that even if there is no literal infringement, one can infringe if one employs a step or steps which are equivalent to those steps in the patent claim which are not met exactly. This rule, called the "doctrine of equivalents", prevents infringers from beating the system by making insignificant changes in the process to avoid literal infringement. *Graver Tank &. Mfg. Co. v. Linde Air Products Co.,* 339 U.S. 605, 607, 94 L. Ed. 1097, 70 S. Ct. 854 (1950); *Corning Glass Works v. Sumitomo Elec. USA, Inc.,* 68 F.2d 1251, 1258 (Fed. Cir. 1989). *Laitram Corp. v. Cambridge Wire Cloth Co.,* 863 F.2d 855, 856-7 (1988).

7. This case involves process claims. Equivalency is made out if the steps of Defendants' accused processes are either the same as the Plaintiff's claim (literal infringement) or the Defendants' processes perform substantially the same function as the corresponding step set forth in the claim in substantially the same way to obtain substantially the same result. *Pennwalt Corp. v. Durand-Wayland Inc.,* 833 F.2d 931, 934 (Fed. Cir. 1987). This is known as infringement by equivalents. Something is "equivalent" if it does not substantially change the way in which the function of the claimed invention is performed. *Pennwalt,* at p. 935. A process may be found to be equivalent if after considering the substantiality of the claimed differences in the new process, the fact finder can conclude that the new process represents an insubstantial change. *Hilton Davis Chemical Co. v. Warner-Jenkinson Co.,* No. 93-1088, 1995 U.S. App. LEXIS 21069 (Fed. Cir. August 8, 1995) (per curiam).

8. The issue of equivalency is a question of fact. *Durango Associates Inc.* v. *Reflange Inc.,* 843 F.2d 1349, 1357 (Fed. Cir. 1988); *Uniroyal Inc. v . Rudkin-Wiley Corp.,* 837 F.2d 1044, 1057 (Fed. Cir. 1988); *Hartness International Inc.*

v. Simplimatic Engineering Co., 819 F.2d 1100, 1110 (Fed. Cir. 1987).

9. In accordance with equitable principles, for infringement to exist under the doctrine of equivalents an accused method must perform substantially the same function, in substantially the same way, to achieve substantially the same result as the invention defined by the claims. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 608, 94 L.Ed. 1097 (1950).

10. To properly apply the *Graver Tank* "function-way-result" test, the function, way and result of each accused process (Process 1 and Process 2) are compared to the function, way and result of the method claimed in the '012 patent. *Malta v. Schulmerich Carillons, Inc.*, 952 F.2d 1320, 1327 (Fed. Cir. 1991); *Lear Siegler, Inc., v. Sealy Mattress Co. of Mich.*, 873 F.2d 1422, 1425-26 (Fed. Cir. 1989).

11. If the evidence shows that even one of these conditions is not satisfied, there can be no infringement by equivalents. *London*, 946 F.2d at 1539; *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1581 (Fed. Cir. 1989); *Lear Seigler*, 873 F.2d at 1581.

12. Each of the three components (function-way-result) must be separately met. *Universal Gym Equip., Inc. v. ERWA Excercise Equip. Ltd.*, 827 F.2d 1542, 1548 (Fed. Cir. 1987). Defendants' Process 1 and Process 2 perform substantially the same function and achieve substantially the same results in substantially the same way as the method claimed in the '012 patent.

13. The doctrine of equivalents is subservient to the doctrine of prosecution history estoppel. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 939 F.2d 1540, 1544 (Fed. Cir.), *reh'g denied*, (1991). Prosecution history estoppel limits the doctrine of equivalents. *Charles Greiner*, 962 F.2d at 1036. Prosecution history estoppel is an equitable tool for determining the permissible scope of patent claims. *Mannesmann DeMag Corp v.*

Engineered Metal Products Co., 793 F.2d 1279, 1284-85 (Fed. Cir. 1986).

14. Although the prior art also limits equivalents, prosecution history estoppel and the prior art are separate and distinct concepts. The limits on equivalency imposed by prosecution history estoppel can be, and frequently are, broader than those imposed by the prior art. *Haynes Intern., Inc. v. Jessup Steel Co., 8* F.3d 1573, 1579 (Fed. Cir. 1993), *modified on reh'g,* 15 F.3d 1275 (Fed. Cir. 1994). In this case, the issue is whether prosecution history estoppel limits the doctrine of equivalents.

15. Prosecution history estoppel limits a patentee's reliance on the doctrine of equivalents by preventing him from contending later in an infringement action that his claims should be interpreted as if limitations added by amendment were not present. *Jonsson v. Stanley Works,* 903 F.2d 812, 821 (Fed. Cir. 1990).

16. Under the doctrine of prosecution history estoppel, where a patent applicant cancels a claim in the Patent Office to distinguish his invention from prior art, and replaces that claim with another claim, the patent owner is deemed to have surrendered the subject matter covered by the original claim, and cannot recapture that subject matter through the doctrine of equivalents. *Haynes,* 8 F.3d at 1577-78; *Wang Laboratories, Inc. v. Toshiba Corp.,* 993 F.2d 858, 868 (Fed. Cir. 1993); *Charles Greiner,* 962 F.2d at 1036; *Diversitech Corp. v. Century Steps, Inc.,* 850 F.2d 675, 681 (Fed. Cir. 1988). There is no surrendered subject matter under the facts of this case.

17. The legal standard for determining what subject matter was surrendered is an objective one, measured from the vantage point of what a competitor was reasonably entitled to conclude, from the prosecution history, that the application gave up to procure issuance of the patent. *Haynes,* 8 F.3d at 1577-78.

18. Whether or not estoppel exists is a question of law, *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 867 (Fed. Cir. 1993), and is determined in the context of the entire prosecution history of the patent -- the prior art, the Examiner's rulings and the patentee's arguments. In *Wang*, 993 F.2d at 858, when the original claims (for a circuit board with memory chips) were rejected as being unpatentable in view of prior art, the applicant cancelled those claims, replacing them with new claims that required the memory chips to be "mounted in a single row." Id. at 867. Those claims eventually issued as part of the patent. The Defendants' accused devices ("lateral memory modules") had *two rows* of memory chips and therefore lacked the very limitation added by amendment (memory chips "mounted in a single row"). The district court permitted the jury to find infringement by equivalents. The Federal Circuit reversed. The court held that "prosecution history estoppel should have been applied to reach the conclusion that the accused lateral memory modules were surrendered during prosecution and therefore do not infringe under the doctrine of equivalents." *Id.* at 868. Even though the specific accused lateral memory modules were not cited prior art during prosecution, the Federal Circuit held that coverage of those devices was surrendered. *Id.* at 867-68.

19. The facts of the present case are distinguishable from the facts in *Wang*. In *Wang*, estoppel was found because in that case the patentee, in arguing to the Examiner, stressed the significance of mounting chips "only in a single row" and that limitation was added to the claims. There estoppel was found excluding multiple row mounting as antithetical to the arguments presented to the Examiner. Similarly in *Charles Greiner & Co. Inc. v. Marri-Med Mfg. Inc.*, 962 F.2d 1031 (Fed. Cir. 1992), the applicant during prosecution of the patent added to the claims the recitation that certain elements were located "only" at a particular location. Since in the accused device there was a different location, estoppel was found. There is nothing corresponding to that in this case.

20. When originally presented but abandoned claims contained limitations in dispute with respect to the applicability

of the doctrine of equivalents, as is the case here, that is an important factor indicating the lack of applicability of the estoppel doctrine to those limitations. *Insta-Foam Products Inc. v. Universal Foam Systems Inc.*, 906 F.2d 698, 703 (Fed. Cir. 1990):

> For the reason that the allowed claim contains the same limitation regarding the connection between the trigger and plunger means as did the abandoned claim, the patent applicant did not disclaim anything relating to the manner by which the plunger and trigger are connected.

See also LaBountry Mfg., Inc. v. U.S. International Trade Commission, op. cit. *supra.*

21. In view of the facts in this case the doctrine of prosecution history estoppel is not available to Defendants.

22. Defendants' single-cup process as described in Finding of Fact 29 does not infringe claim 1 of the '012 patent, under the doctrine of equivalents.

23. Defendants' Process 1 infringes claim 1 of the '012 patent under the doctrine of equivalents.

24. Defendants' Process 2 infringes claim 1 of the '012 patent under the doctrine of equivalents.

25. Plaintiffs are entitled to an immediate injunction against the carrying out by the Defendants of any of the infringing processes here dealt with and from carrying out any other impregnation process which infringes those claims.

26. Defendants are hereby enjoined from carrying out either of the two impregnation processes described herein which infringes upon the Plaintiff's claim.

27. An appeal as a matter of right is now appropriate under 28 U.S.C. §1292(c)(2), on the issues of the validity of the '012 patent and infringement of that patent by the Defendants under the doctrine of equivalents or by literal infringement.

Signed this___day of_____, 1995.

_____
VANESSA D. GILMORE
UNITED STATES DISTRICT JUDGE

Appendix C

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

TOBOR & GOLDSTEIN

DEC 17 1996

RECEIVED

96-1078,-1099

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V. and INSITUFORM GULF SOUTH, INC,

Plaintiffs-Cross/Appellants,

v.

CAT CONTRACTING, INC., MICHIGAN SEWER CONSTRUCTION, KANAL SANIERUNG HANS MUELLER GmbH & CO KG and INLINER U.S.A.

Defendants-Appellants.

O R D E R

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

ORDER

A combined petition for rehearing and suggestion for rehearing in banc having been filed by the APPELLANTS, and the petition for rehearing having been referred to the panel that heard the appeal, and thereafter the suggestion for rehearing in banc having been referred to the circuit judges who are in regular active service,

UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for rehearing be, and the same hereby is, DENIED and it is further

ORDERED that the suggestion for rehearing in banc be, and the same hereby is, DECLINED.

The mandate of the court will issue on December 20, 1996.

FOR THE COURT,
JAN HORBALY, CLERK

Dated: December 13, 1996

By /s/ Brian P. LeDuc
Brian P. LeDuc
Associate Chief Deputy Clerk

cc: EDWARD W. GOLDSTEIN
HAROLD JAMES

INSITUFORM TECH V CAT CONTRACTING, 96-1078, -1099 (DCT - H-90-1690)

FILED
U.S. COURT OF APPEALS FOR
THE FEDERAL CIRCUIT

DEC 13 1995

CLERK

* ***\